



GP 238#5

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: JOHNSON  
Serial No. 68/133,986  
Filed TRADEMARK OFFICE October 12, 1993  
Examiner : R. Bayerl

Group Art Unit: 2301  
Due Date: July 6, 1994  
Docket: 7709.18US03

Title : COMPUTER-ASSISTED PARTS SALES METHOD

7560 Allowed  
093 S. 1e 5  
5/19/94

The Commissioner of Patents and Trademarks  
ATTN: Official Draftsman  
Washington, D.C. 20231

Sir:

We are transmitting herewith the attached:

- Transmittal Sheet in duplicate containing certificate under 37 CFR 1.8.  
 A verified statement to establish small entity status under 37 C.F.R. 1.9 and 1.27.  
 A signed Combined Declaration and Power of Attorney.  
 A Request for Extension of Time for \_ months and fee of \$\_.  
 A check in the amount of \$\_, for \_.
- A return postcard.

Other: Submission of Formal Drawings (1 page communication); 74 pages of formal drawings.

Amendment  No Additional fee is required  The fee has been calculated as shown:

CLAIMS AS AMENDED

	(1) CLAIMS REMAINING AFTER AMENDMENT	#	(2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(3) PRESENT EXTRA	SMALL ENTITY		OTHER		
					RATE	ADD'L FEE	or	RATE	ADD'L FEE
TOTAL CLAIMS	-		=		x 11 =	\$	or	x 22 =	\$
INDEPENDENT CLAIMS	-		3 =		x 37 =	\$	or	x 74 =	\$
( ) FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM					+115 =	\$	or	+ 230 =	\$
					TOTAL	\$			\$

Please consider this a PETITION FOR EXTENSION OF TIME for a sufficient number of months to enter these papers and please charge any additional fees or credit overpayment to Deposit Account No. 13-2725. A duplicate copy of this sheet is enclosed.

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this Transmittal Letter and the paper, as described hereinabove, are being deposited in the United States Postal Service, as first class mail, in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on this 23rd day of May, 1994.

MERCHANT, GOULD, SMITH, EDELL, WELTER & SCHMIDT  
3100 Norwest Center, Minneapolis, MN 55402 (612-332-5300)

By: Lance L. Vietzke  
Name: Lance L. Vietzke  
Reg. No.: 36,708  
LLV/mas



#15

BATCH NO. A55

PATENTS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: JOHNSON

Examiner: R. Bayerl

Serial # : 08/133,986

Group Art Unit: 2301

Filed : October 12, 1993

Docket: 7709.18US03

Title : COMPUTER-ASSISTED PARTS SALES METHOD

SUBMISSION OF FORMAL DRAWINGS

The Commissioner of Patents  
and Trademarks

Attn: Official Draftsman  
Washington, D.C. 20231

Dear Sir:

Submitted herewith are 74 sheet(s) of Formal Drawings for completion of this application in response to the Notice of Allowance dated May 6, 1994.

Respectfully submitted,

5-23-94

Date

Lance L. Vietzke

Lance L. Vietzke  
Reg. No.: 36,708

MERCHANT, GOULD, SMITH, EDELL,  
WELTER & SCHMIDT, P.A.  
3100 Norwest Center  
90 South Seventh Street  
Minneapolis, Minnesota 55402  
(612) 332-5300

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231

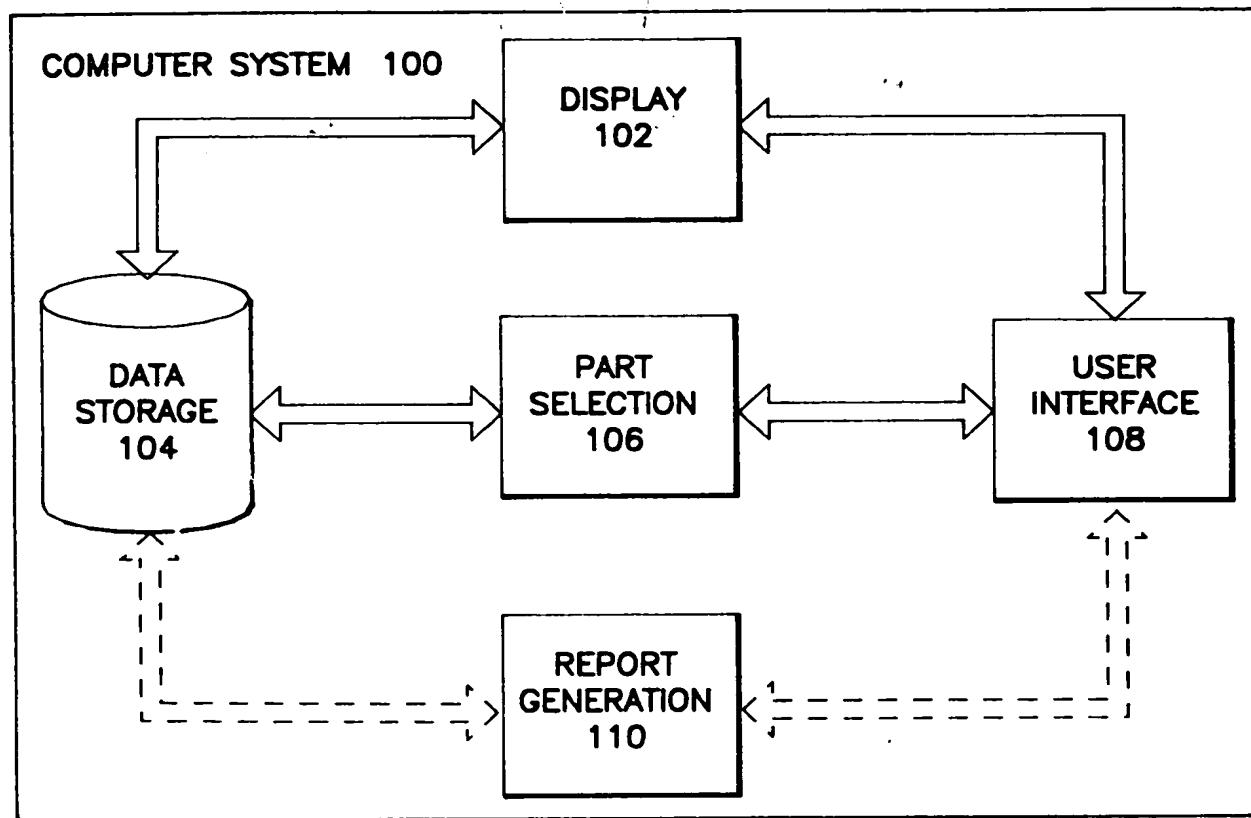
on 5-23-94  
(Date of Deposit)

Lance L. Vietzke

133986

5367627

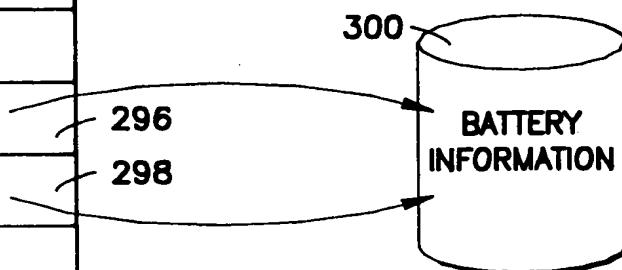
FIG. 1



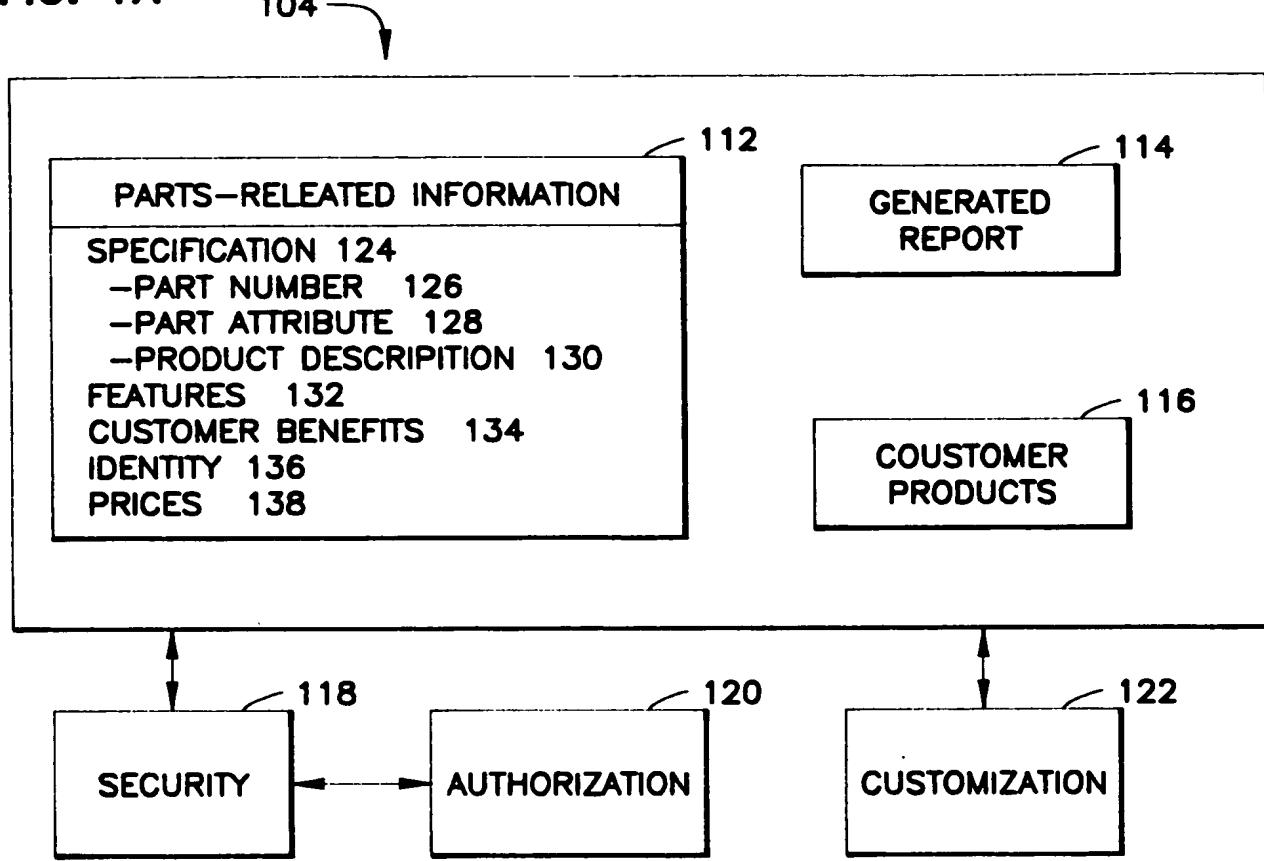
294

NATURAL ORDER		
PART #		
BCI		
COLD CRANKING AMPS		
RESERVE CAP.		
VOLTAGE		
LENGTH		
WIDTH		
HEIGHT		
WARRANTY		
PRICE		

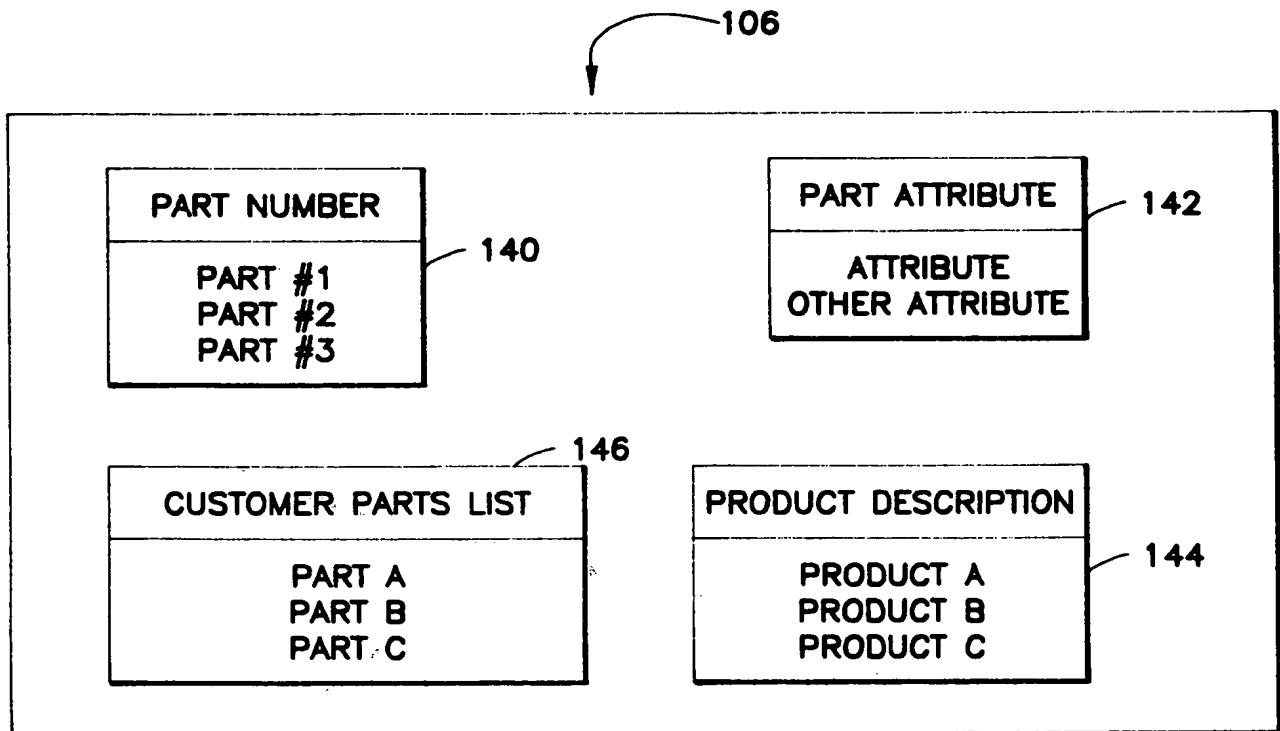
FIG. 6



**FIG. 1A**



**FIG. 1B**



108

FIG. 1C

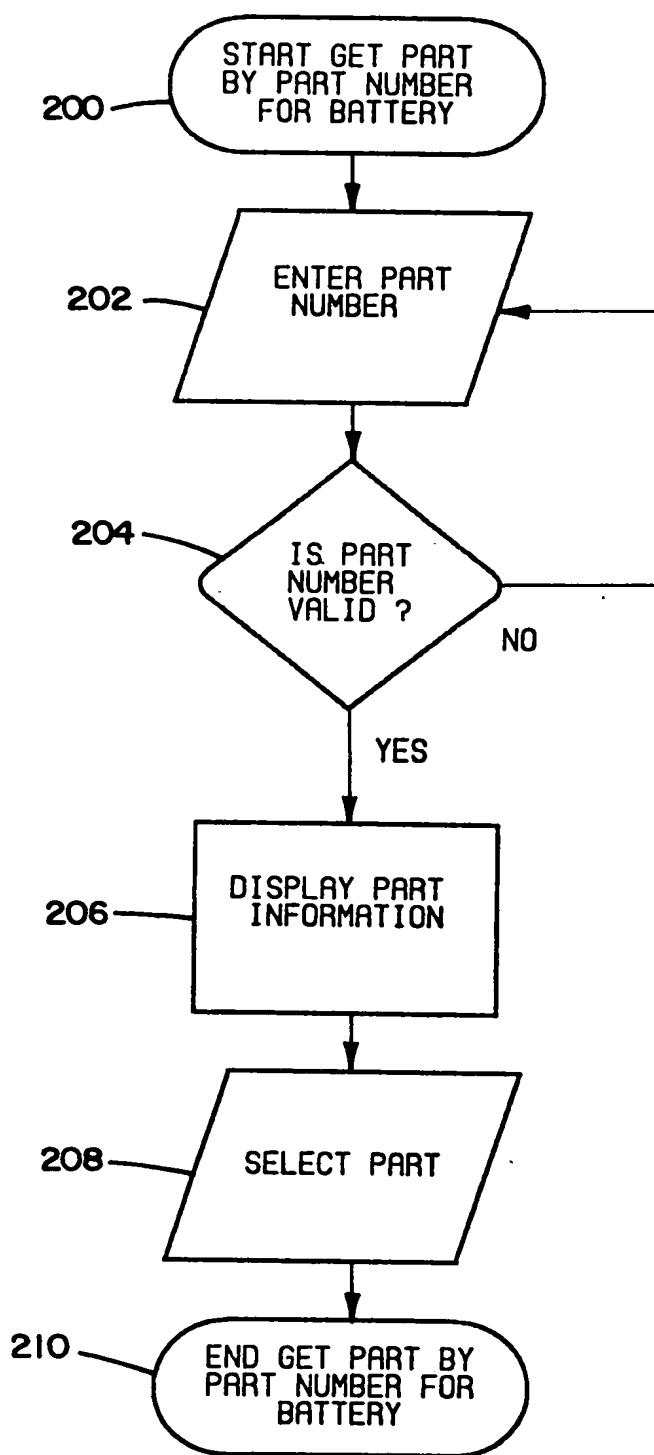
SEQUENTIAL DISPLAY GENERATION	148
- COLOR SEQUENCE GENERATION	150
- CUSTOMIZED TEXT DISPLAY GENERATION	152
- CUSTOMIZED SEQUENCE GENERATION	154
ANIMATED DEMONSTRATION GENERATION	156

110

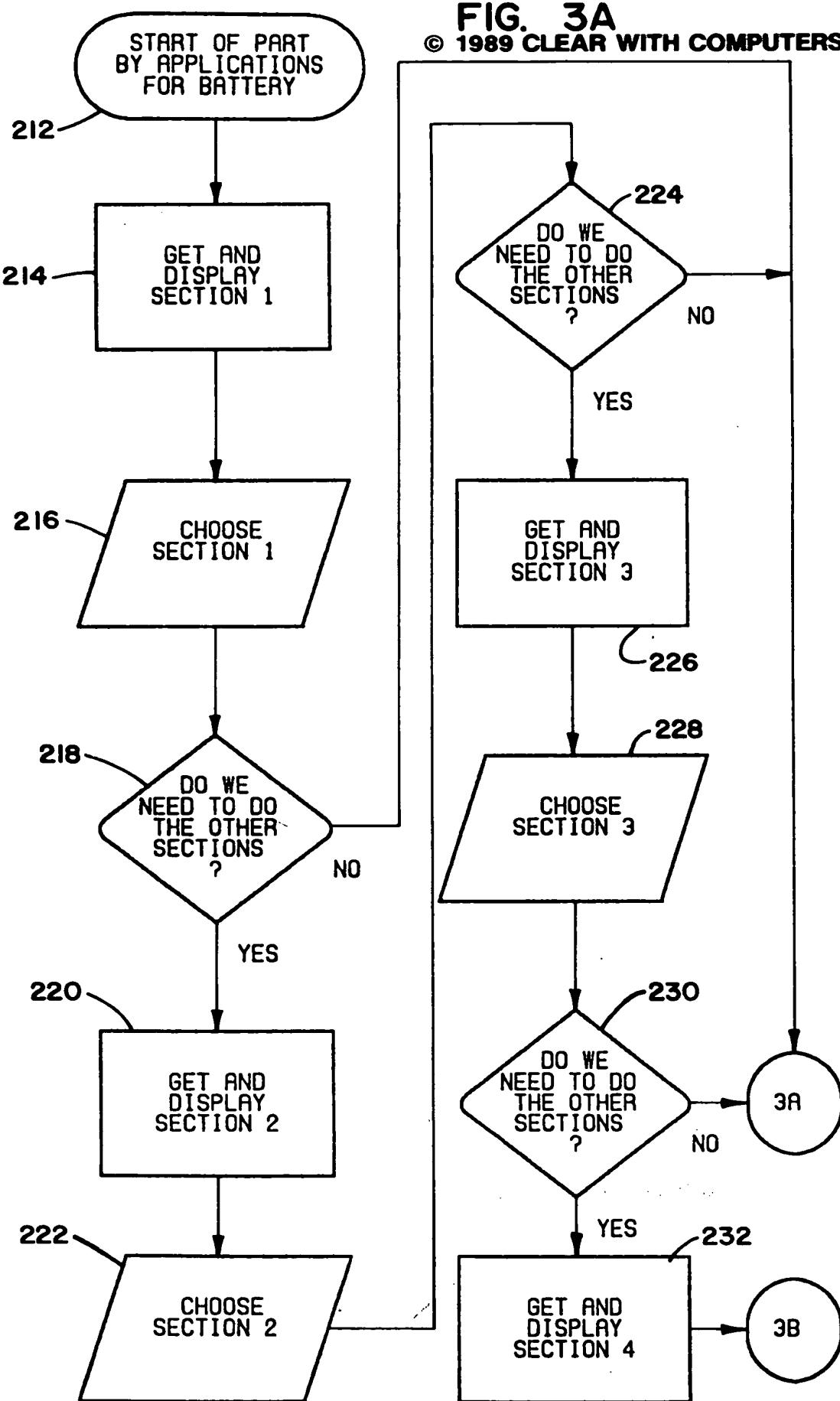
FIG. 1D

DEALER PERSONALIZATION	157
CUSTOMER PERSONALIZATION	158
RETRIEVE STORED REPORT	160
UPDATE REPORT	162
PRINTED GRAPHICS GENERATION	164
PRINTED COLOR GENERATION	166

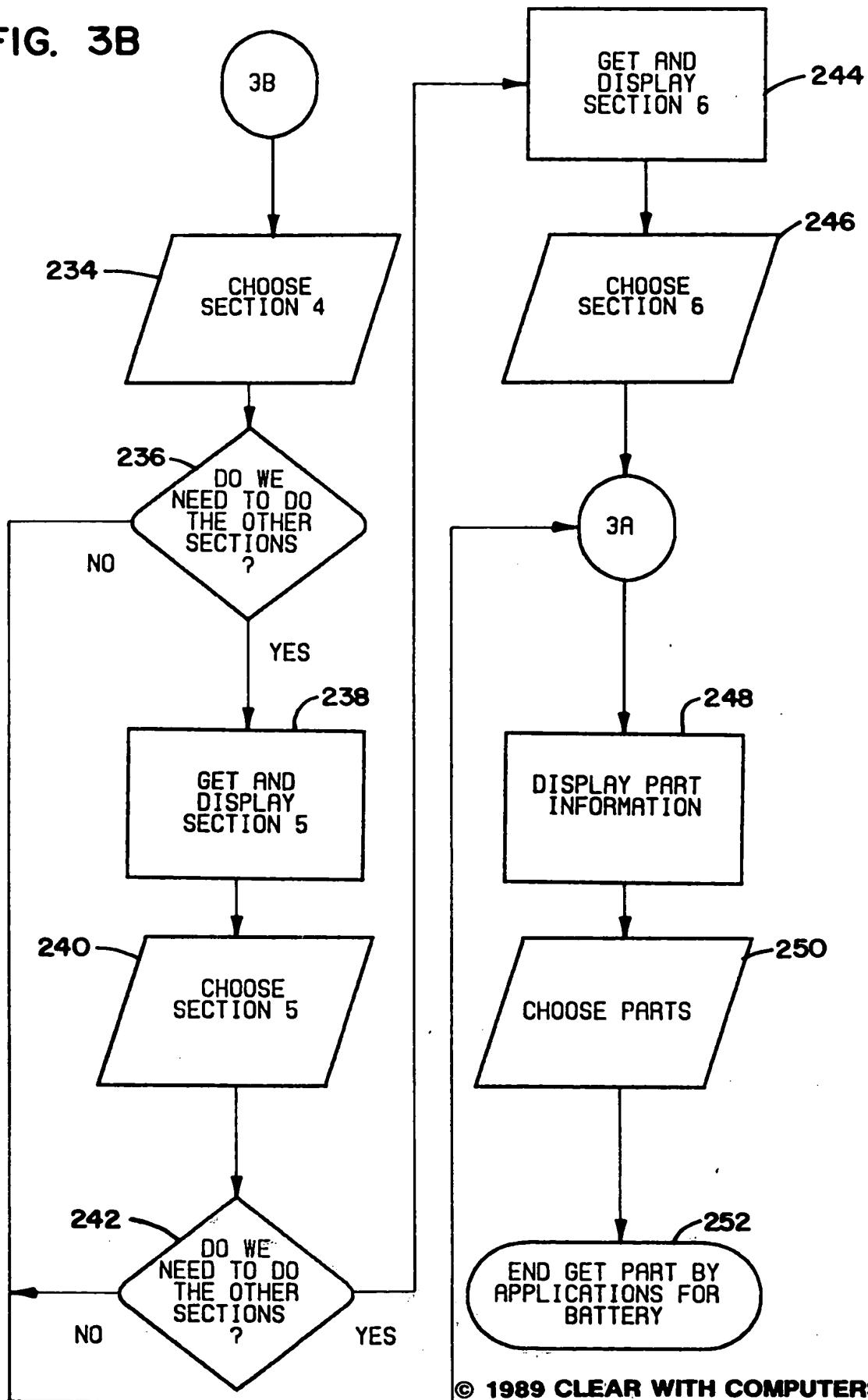
**FIG. 2**



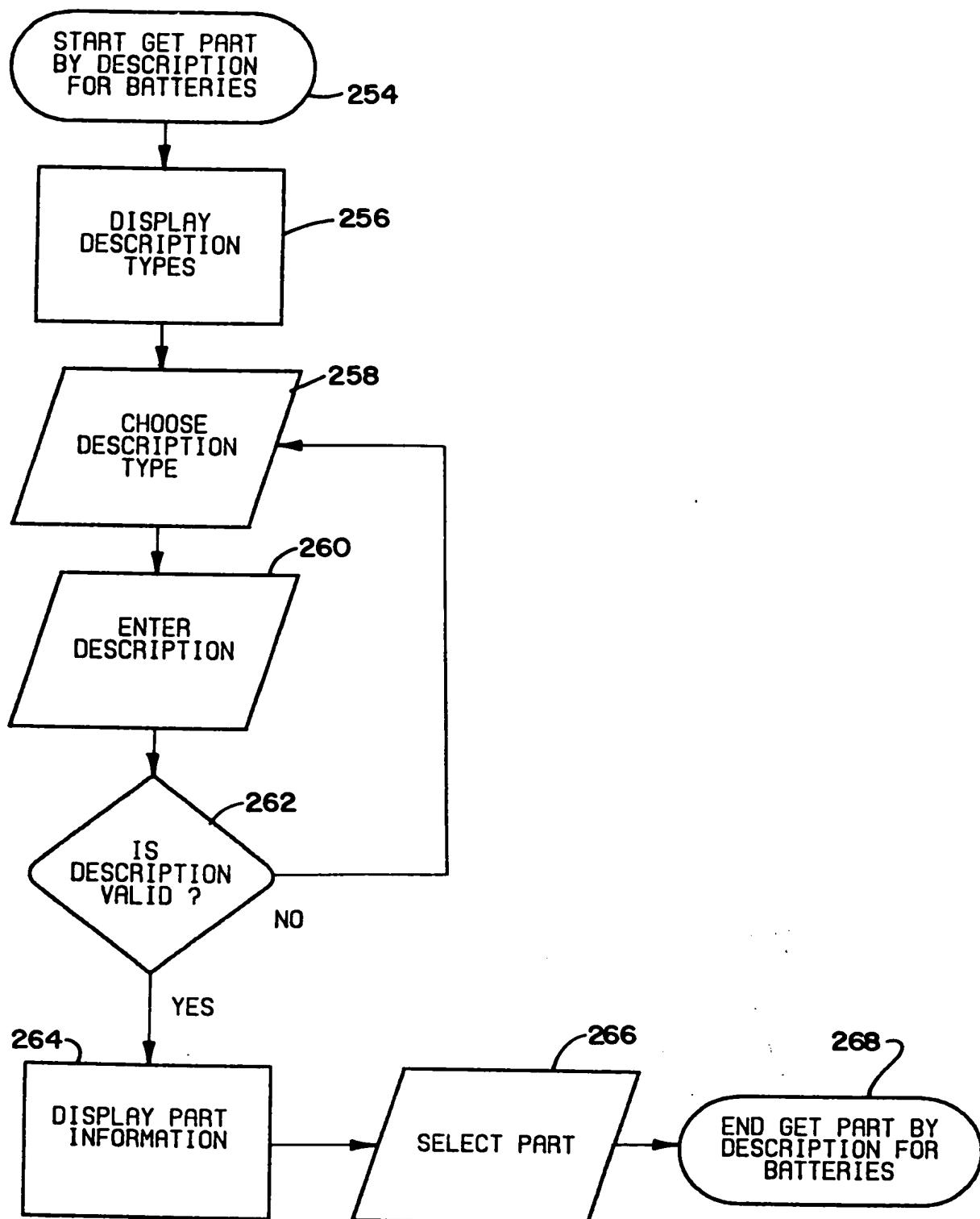
**FIG. 3A**  
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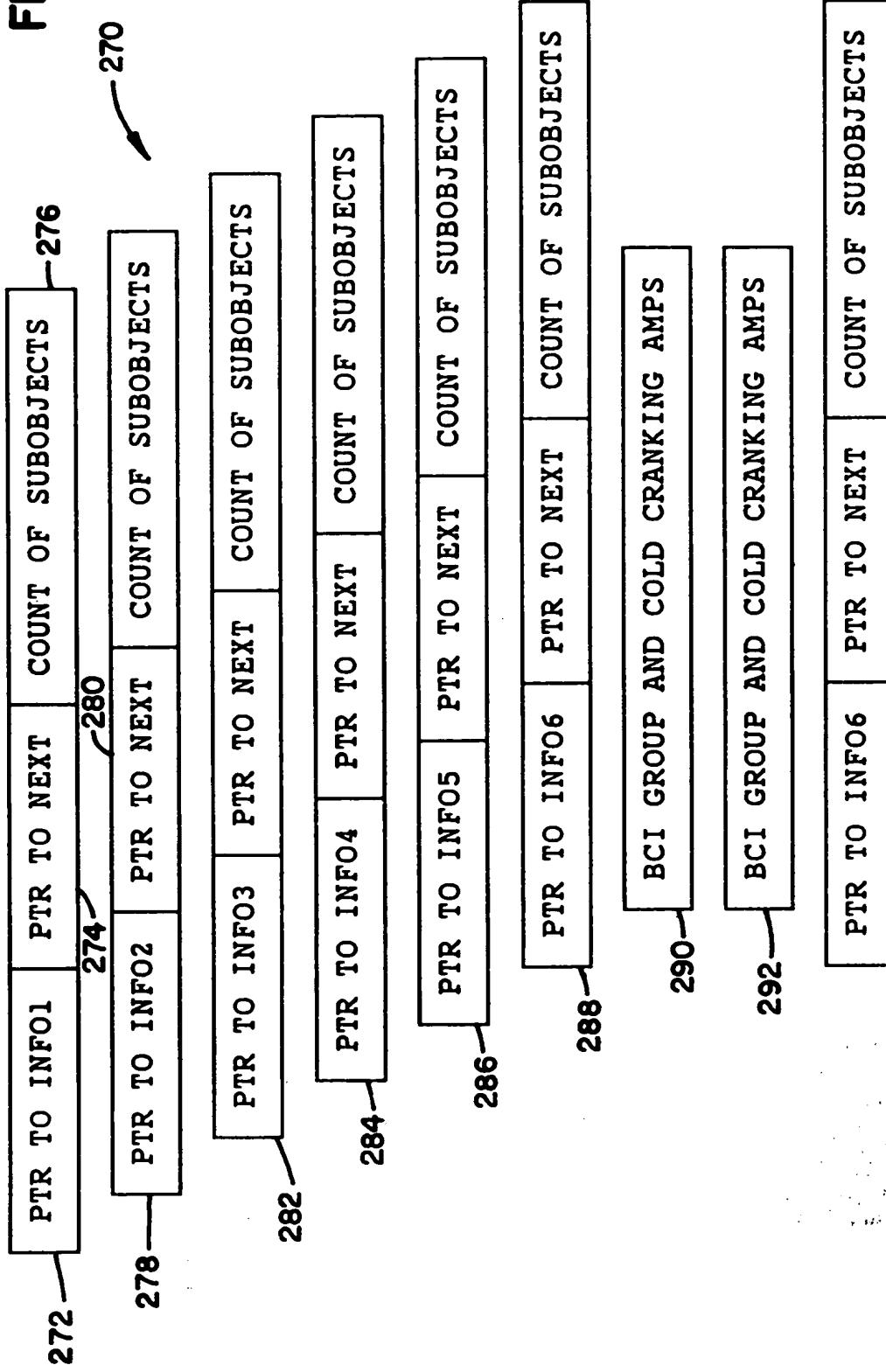
**FIG. 3B**



**FIG. 4**



**FIG. 5**



**FIG. 7**

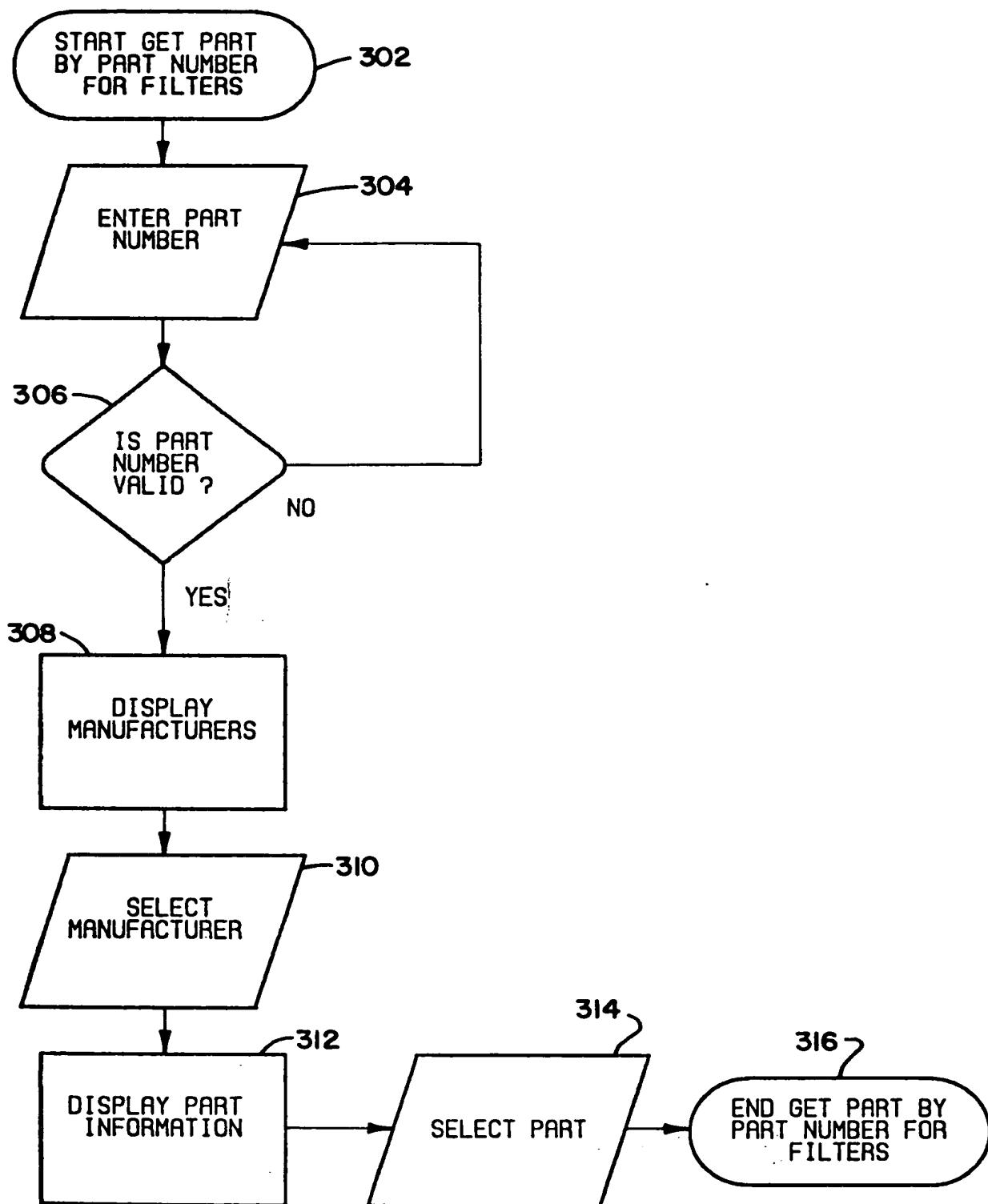
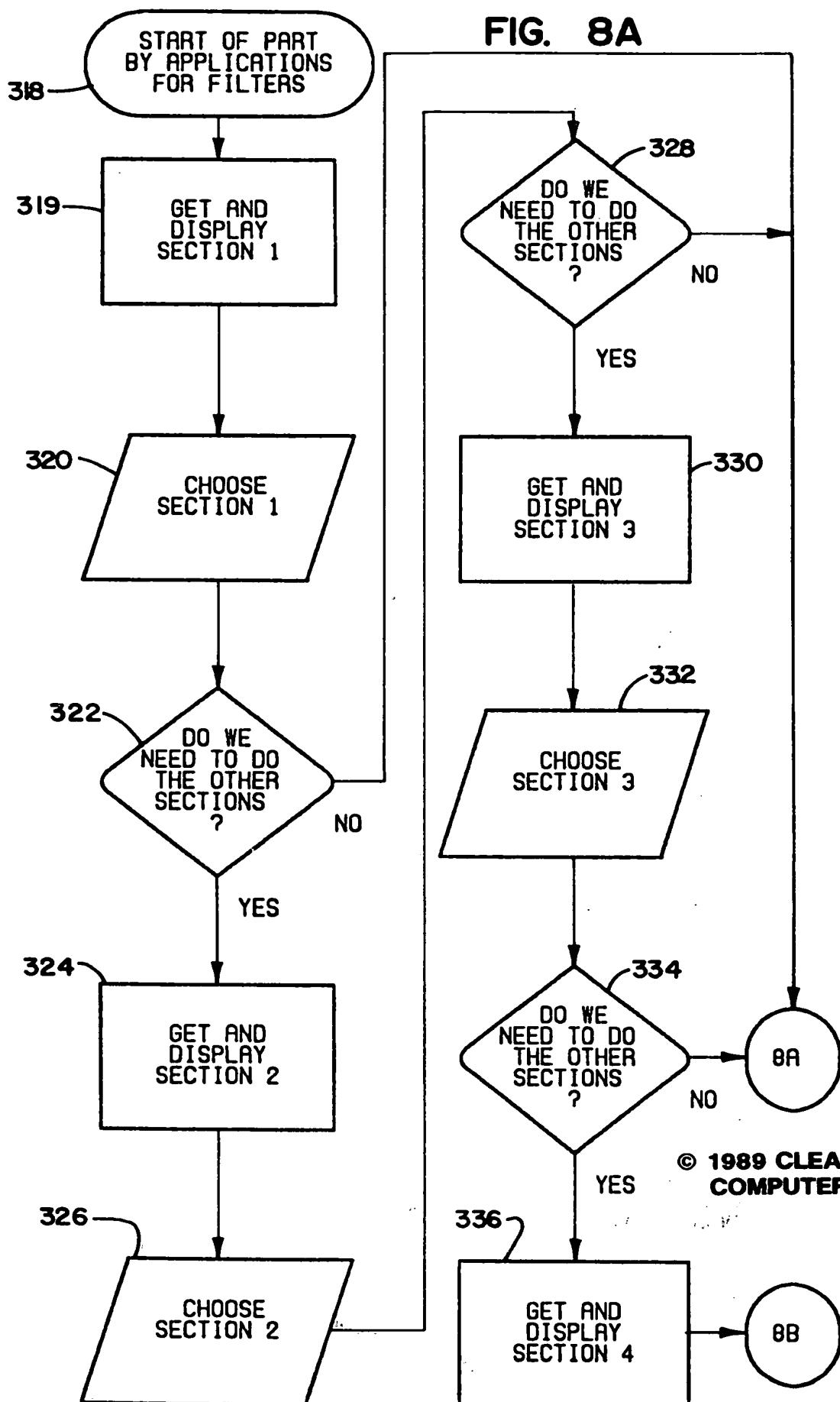
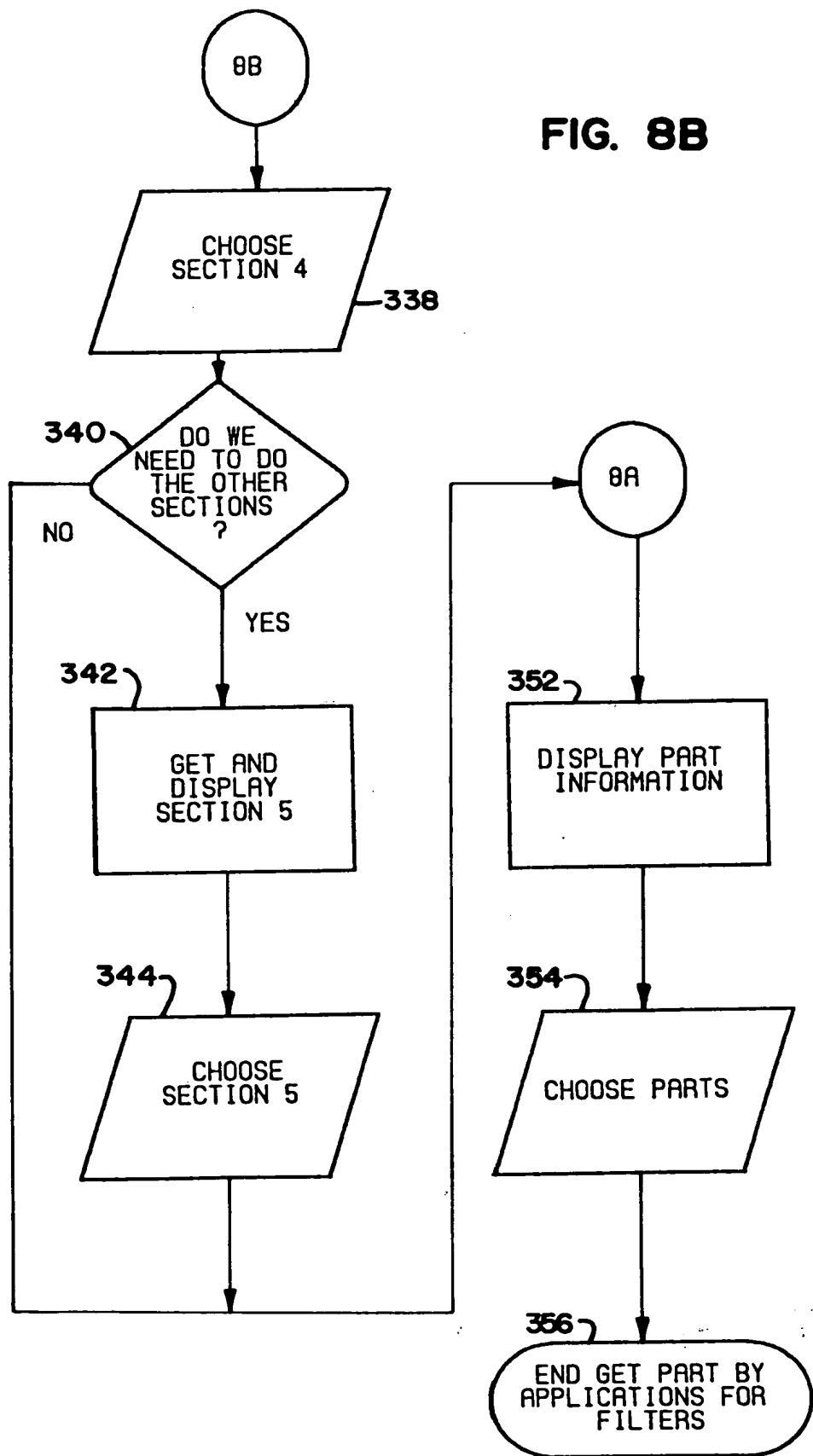


FIG. 8A

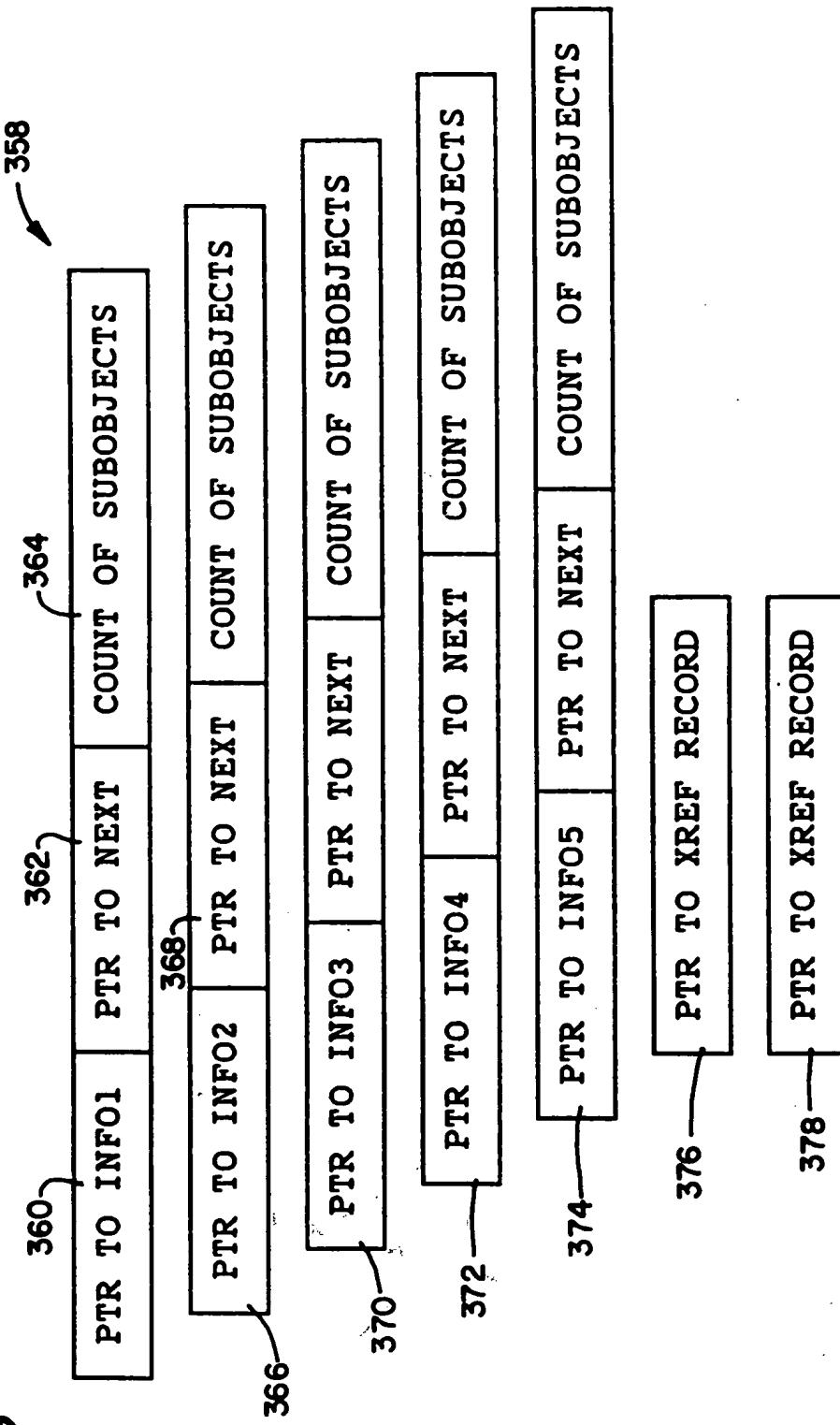


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**FIG. 8B**

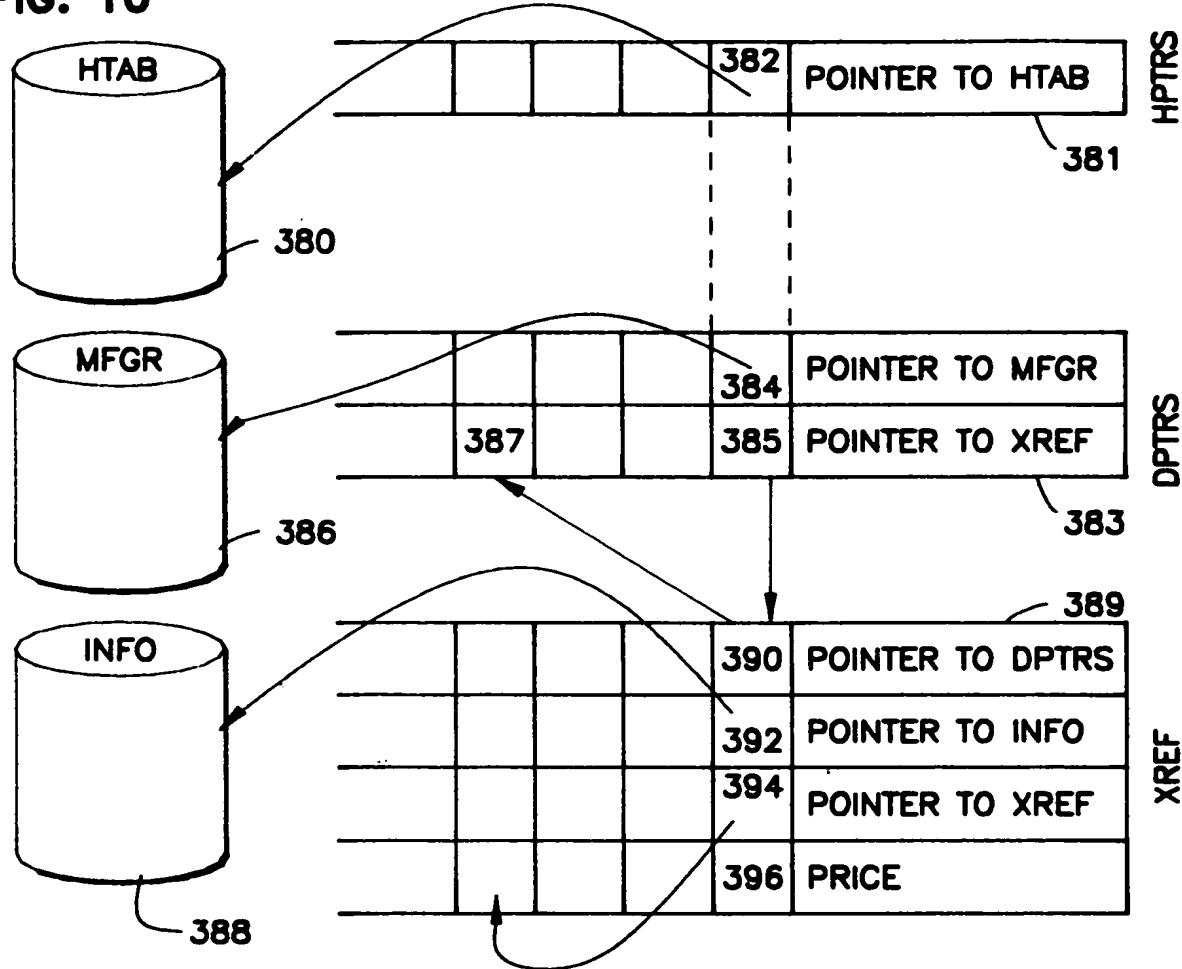


**FIG. 9**

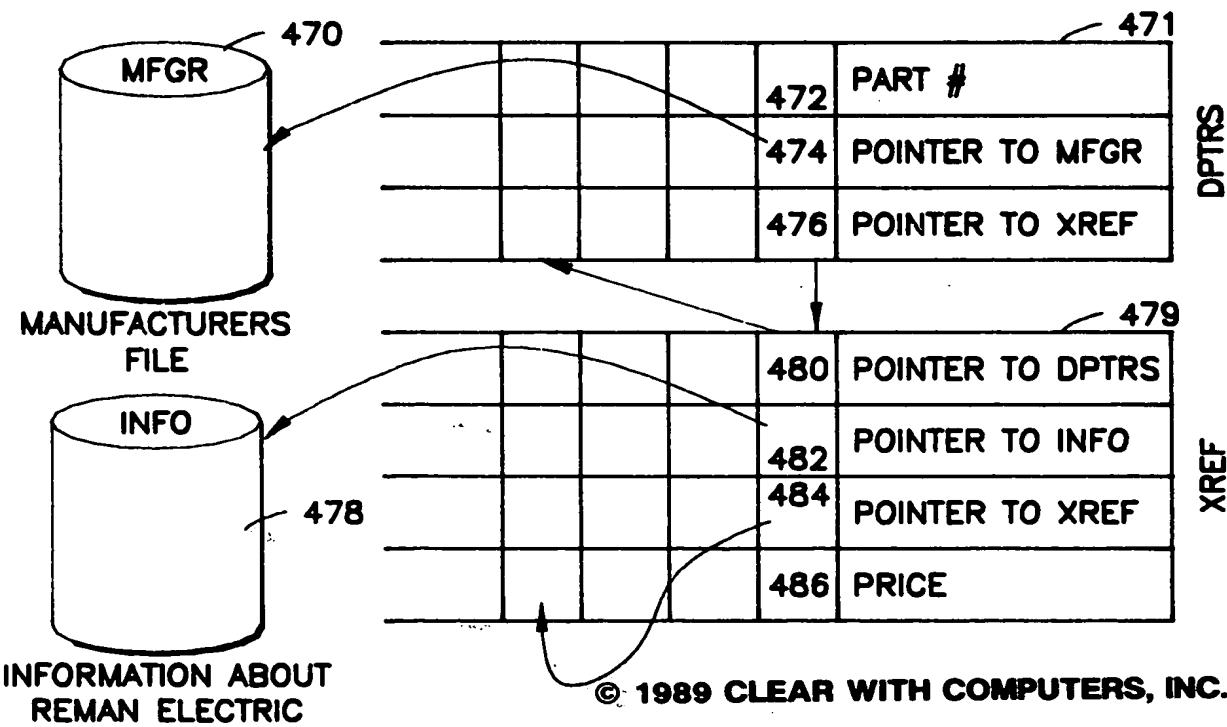


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**FIG. 10**



**FIG. 14**



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**FIG. 11**

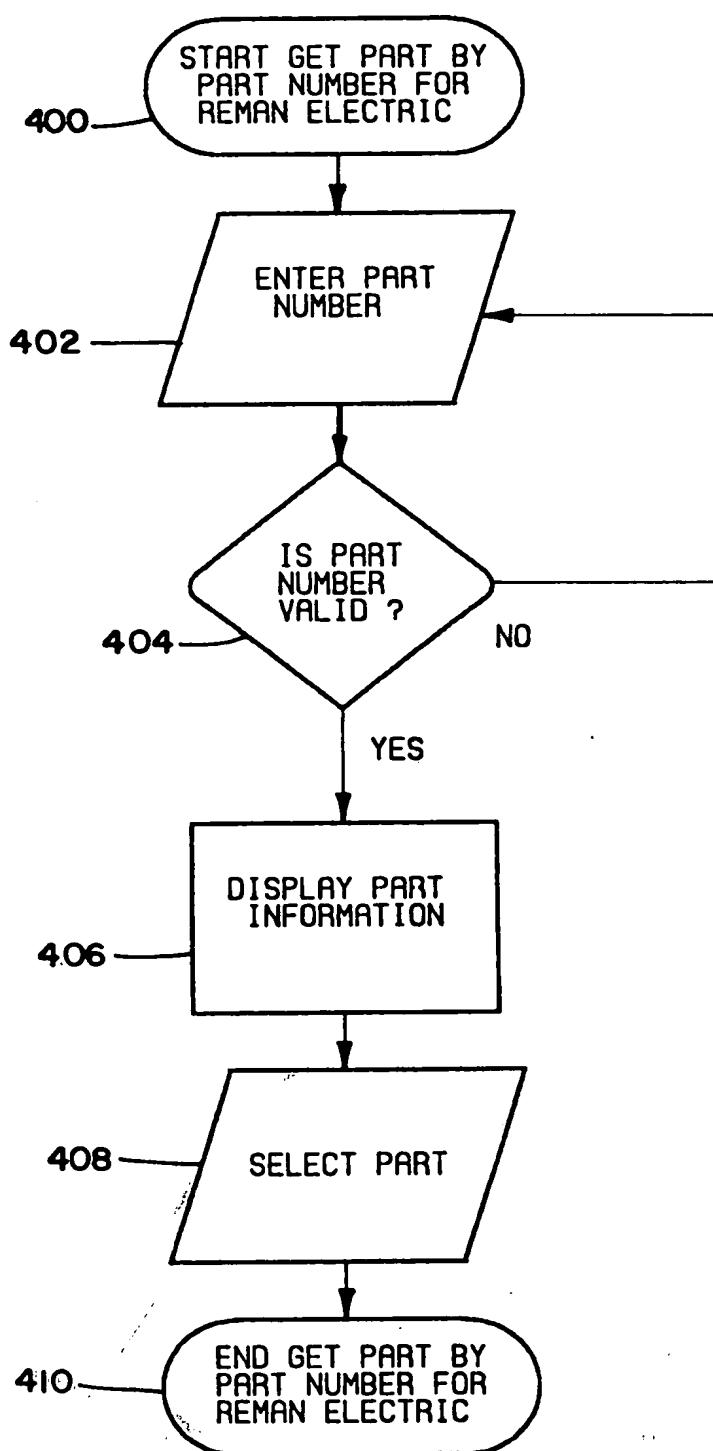
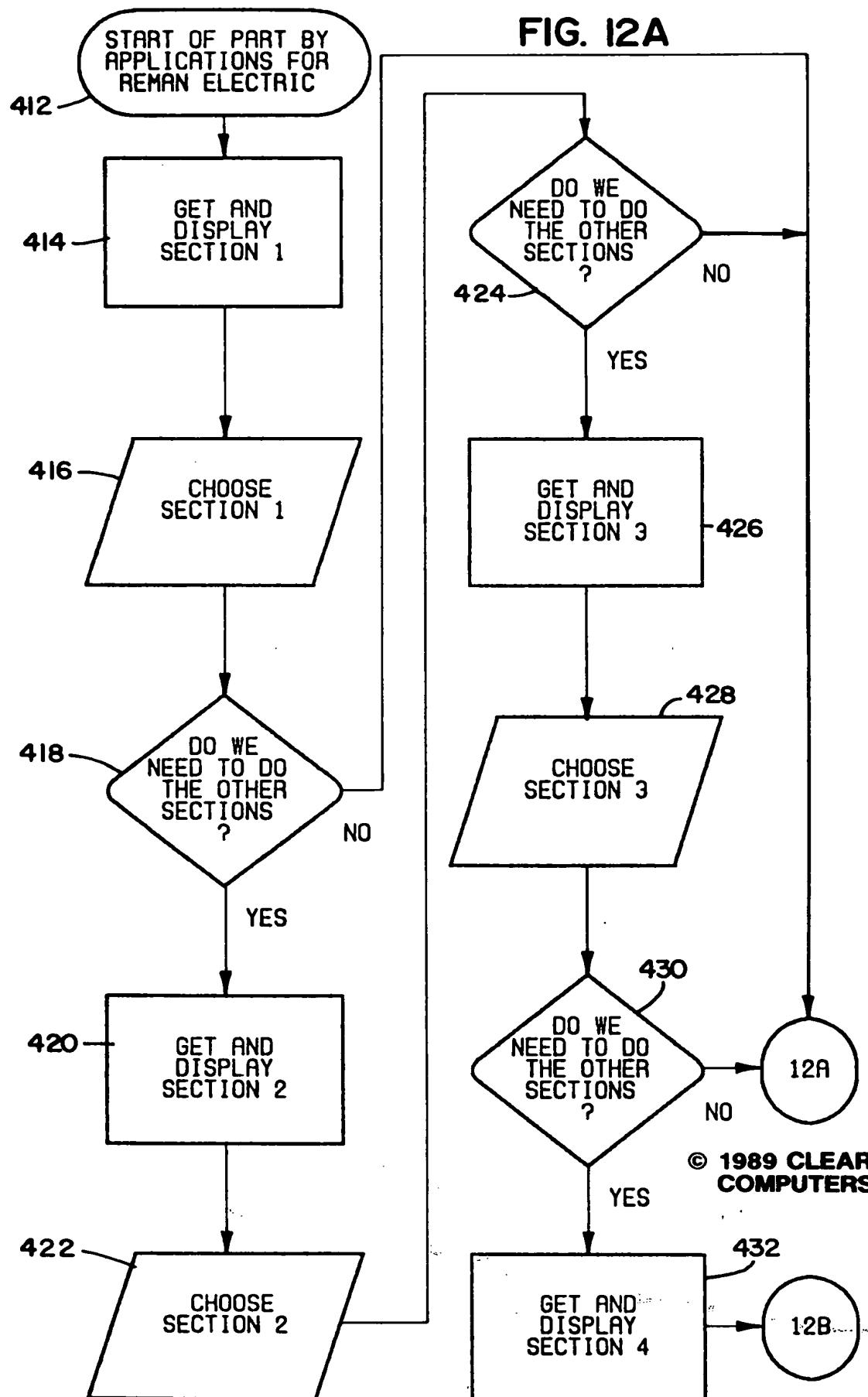
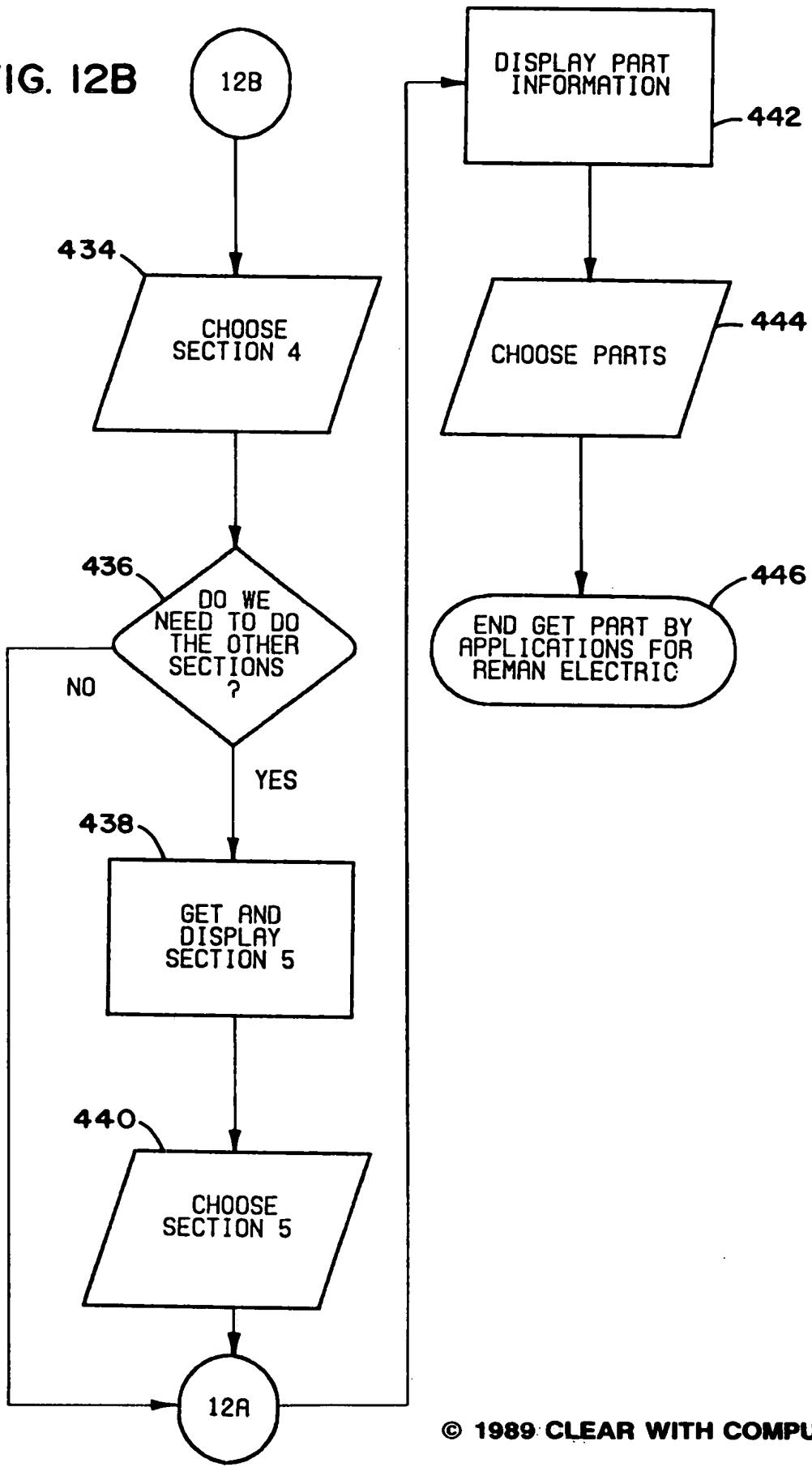


FIG. I2A

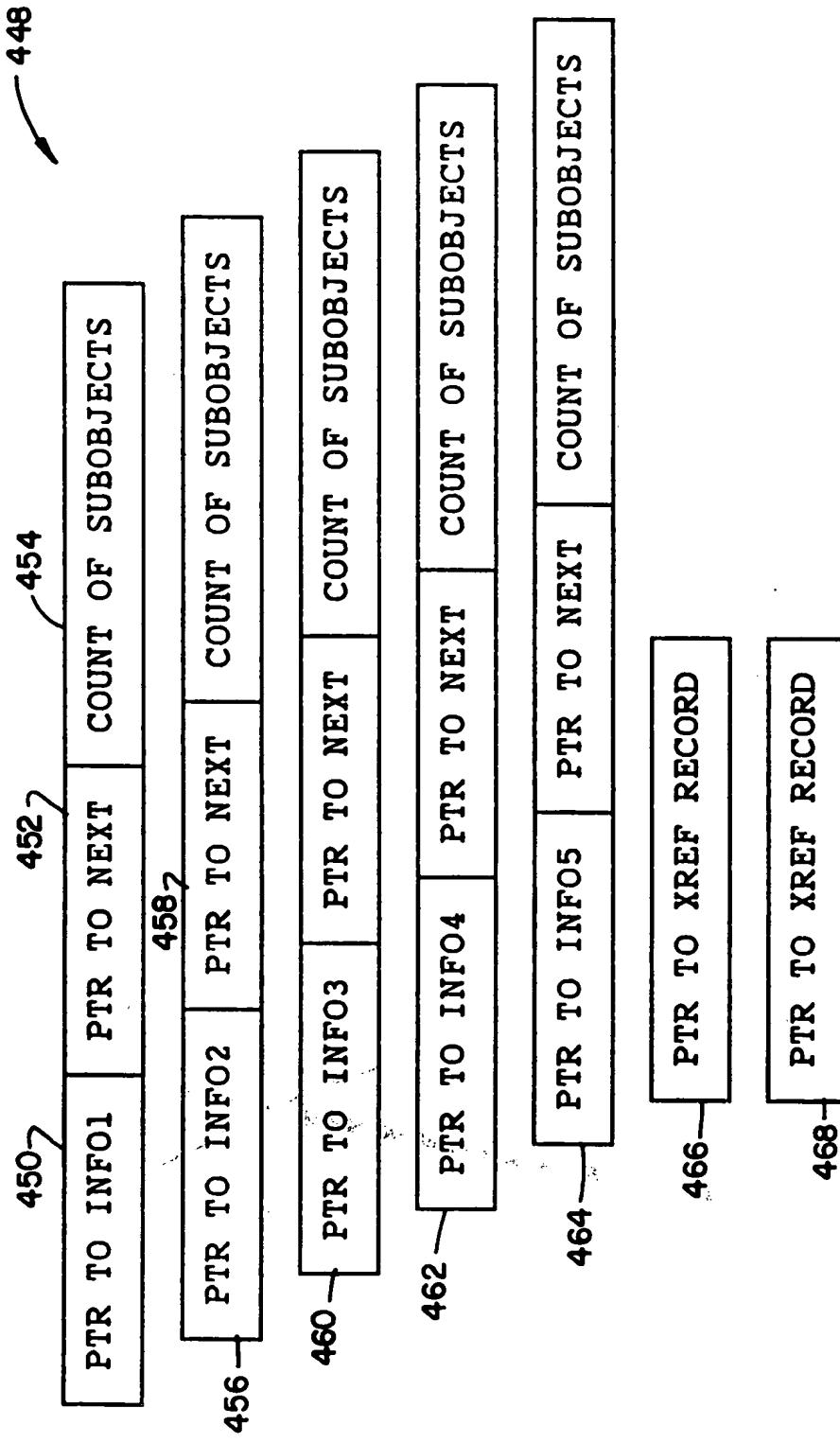


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**FIG. 12B**

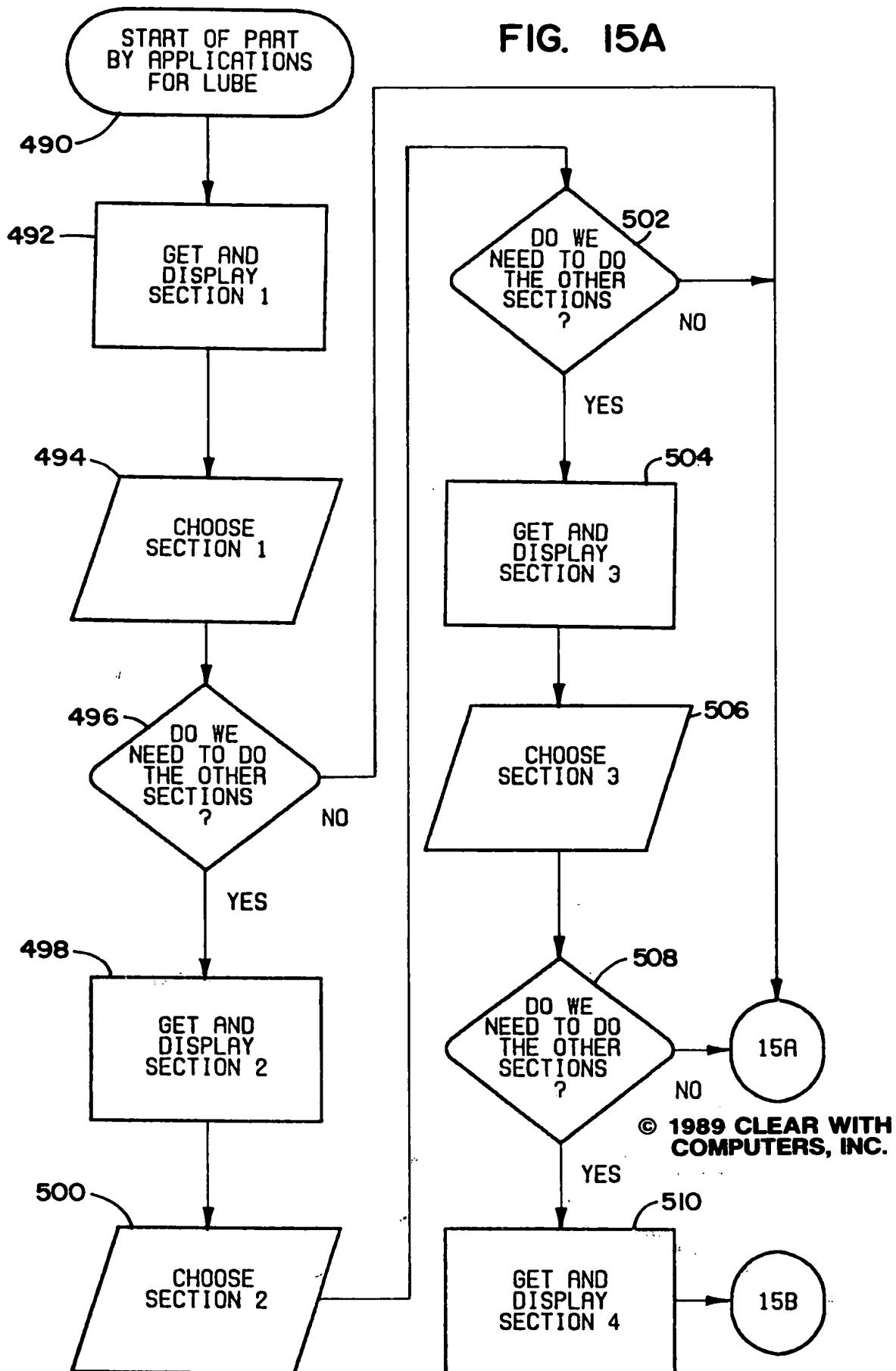


**FIG. 13**



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FIG. 15A



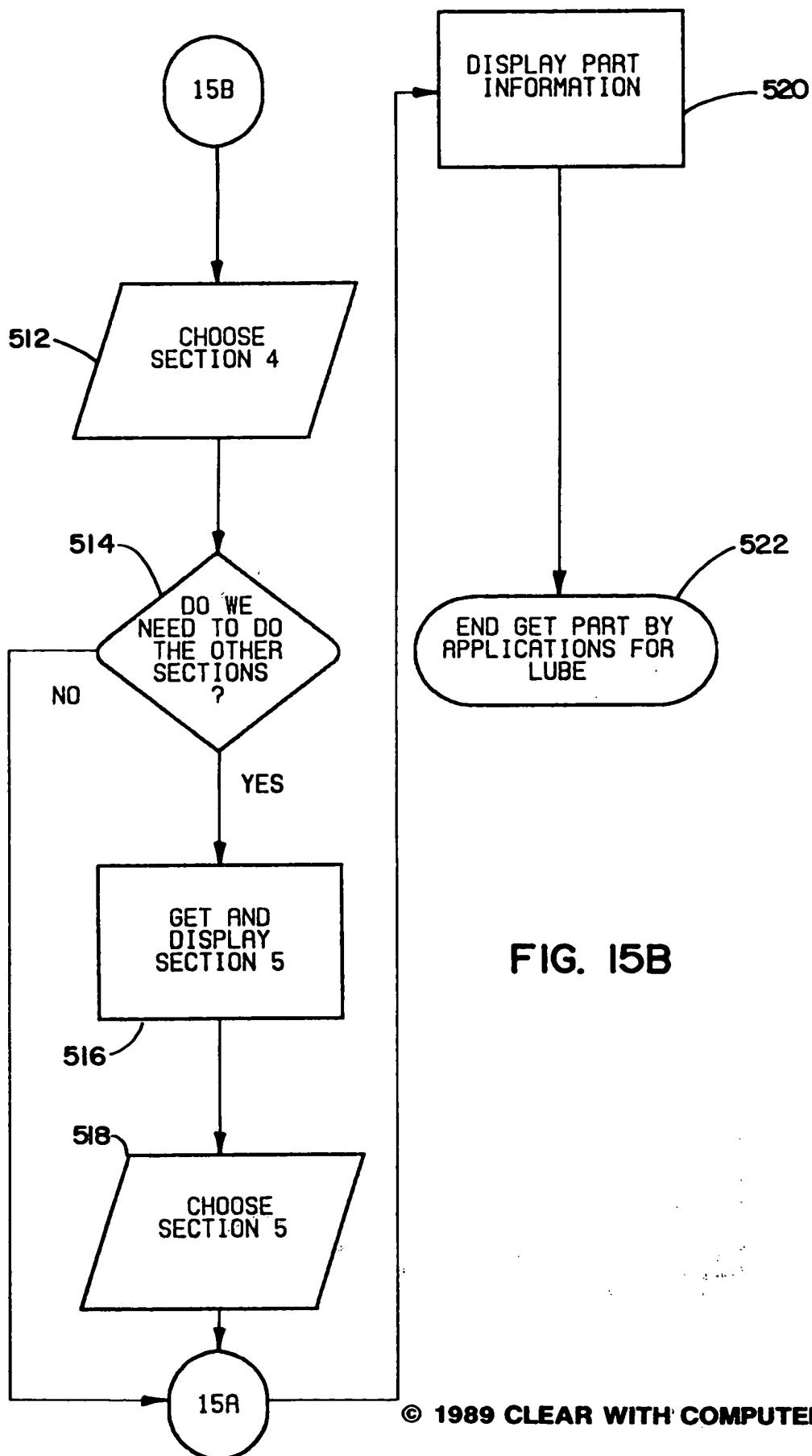
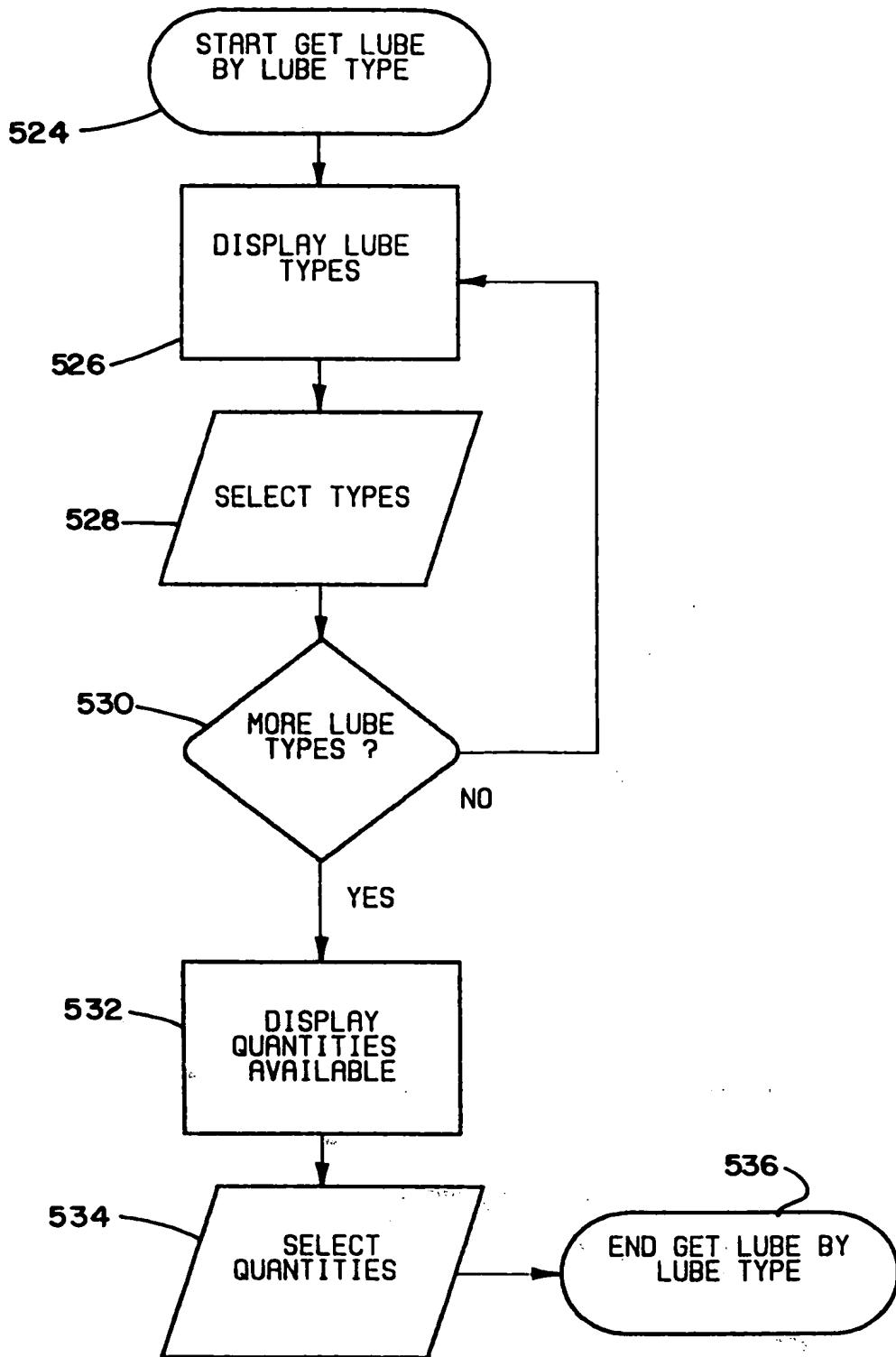
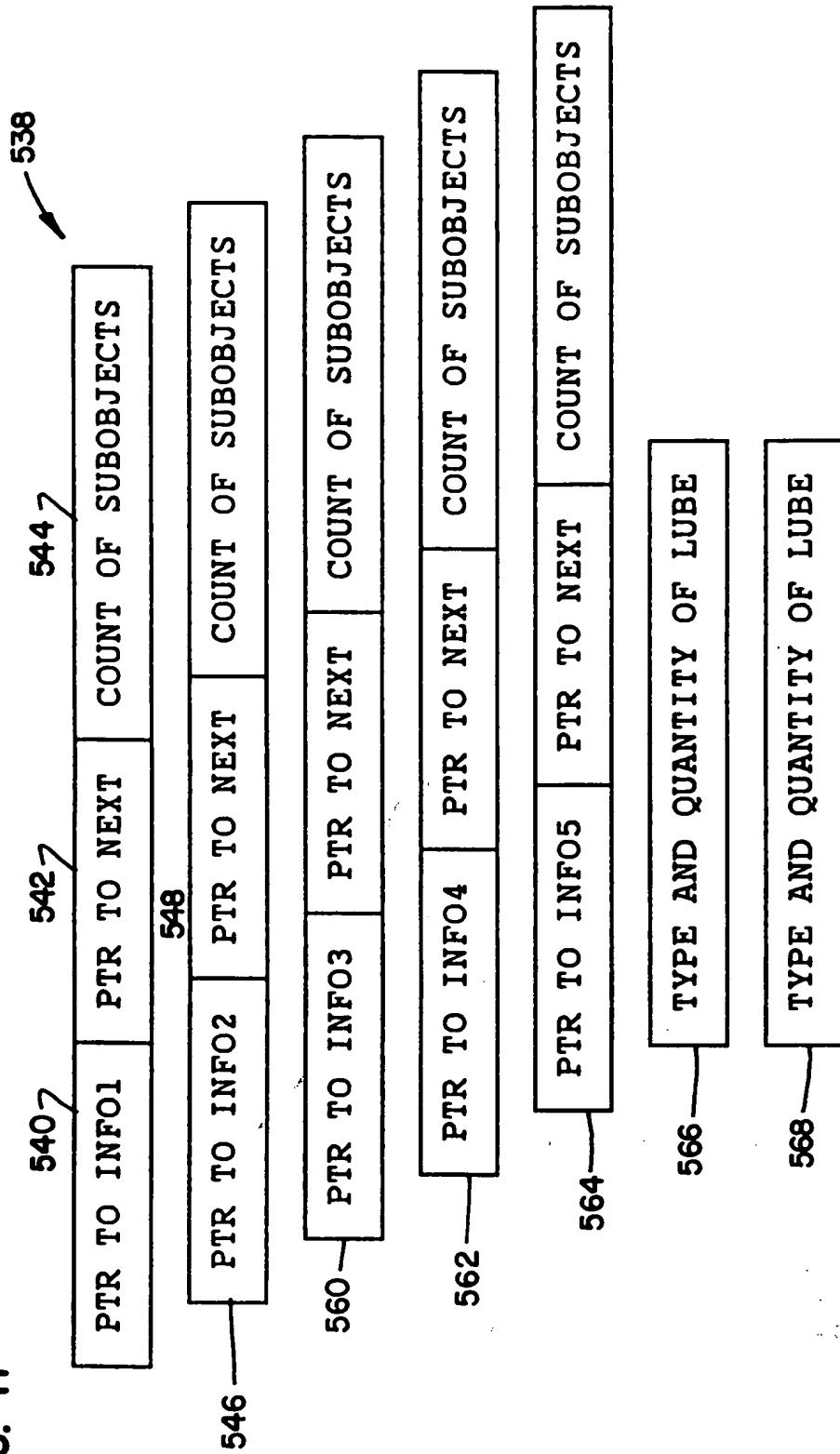


FIG. 15B

**FIG. 16**

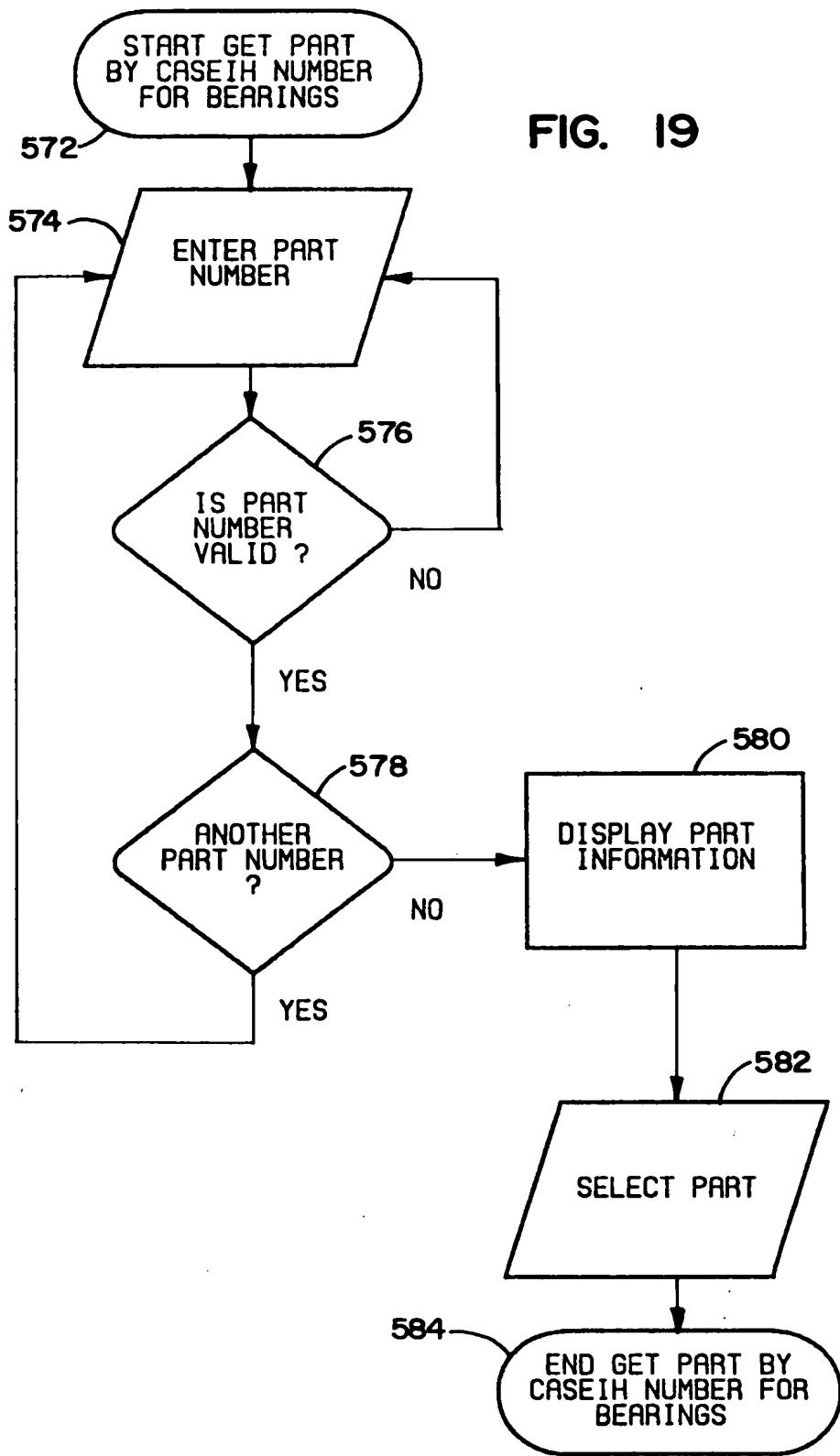


**FIG. 17**

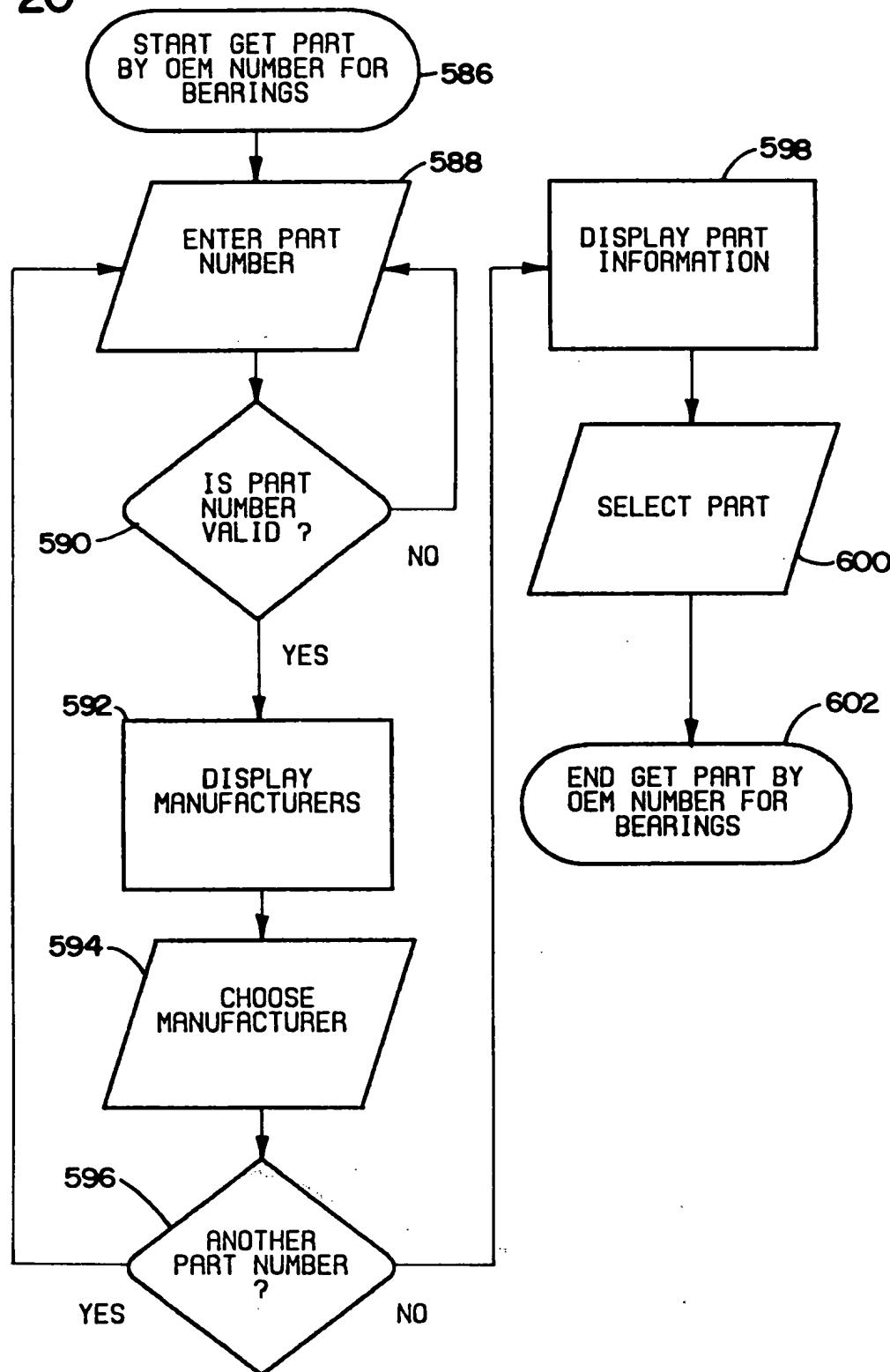


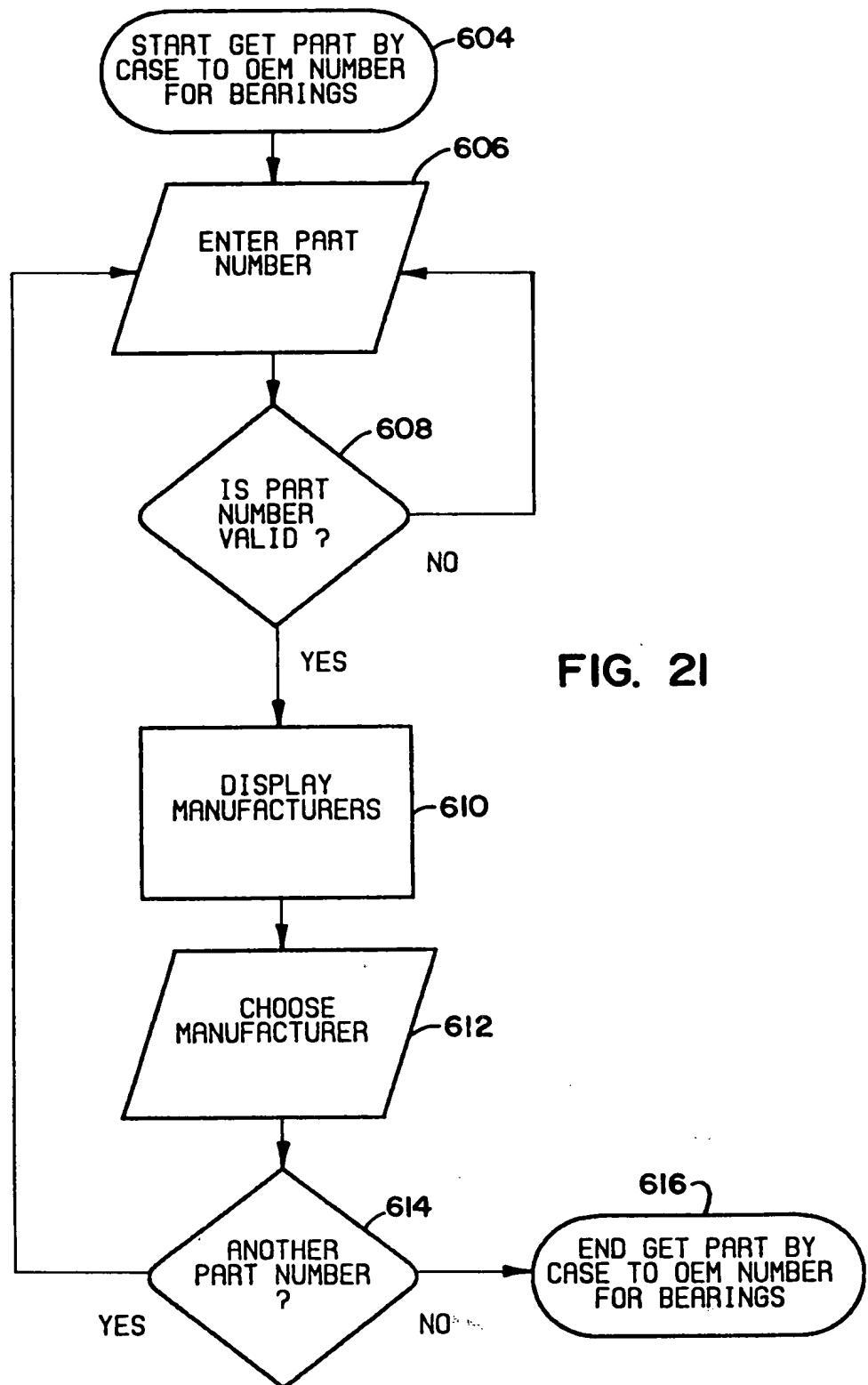
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FIG. 19



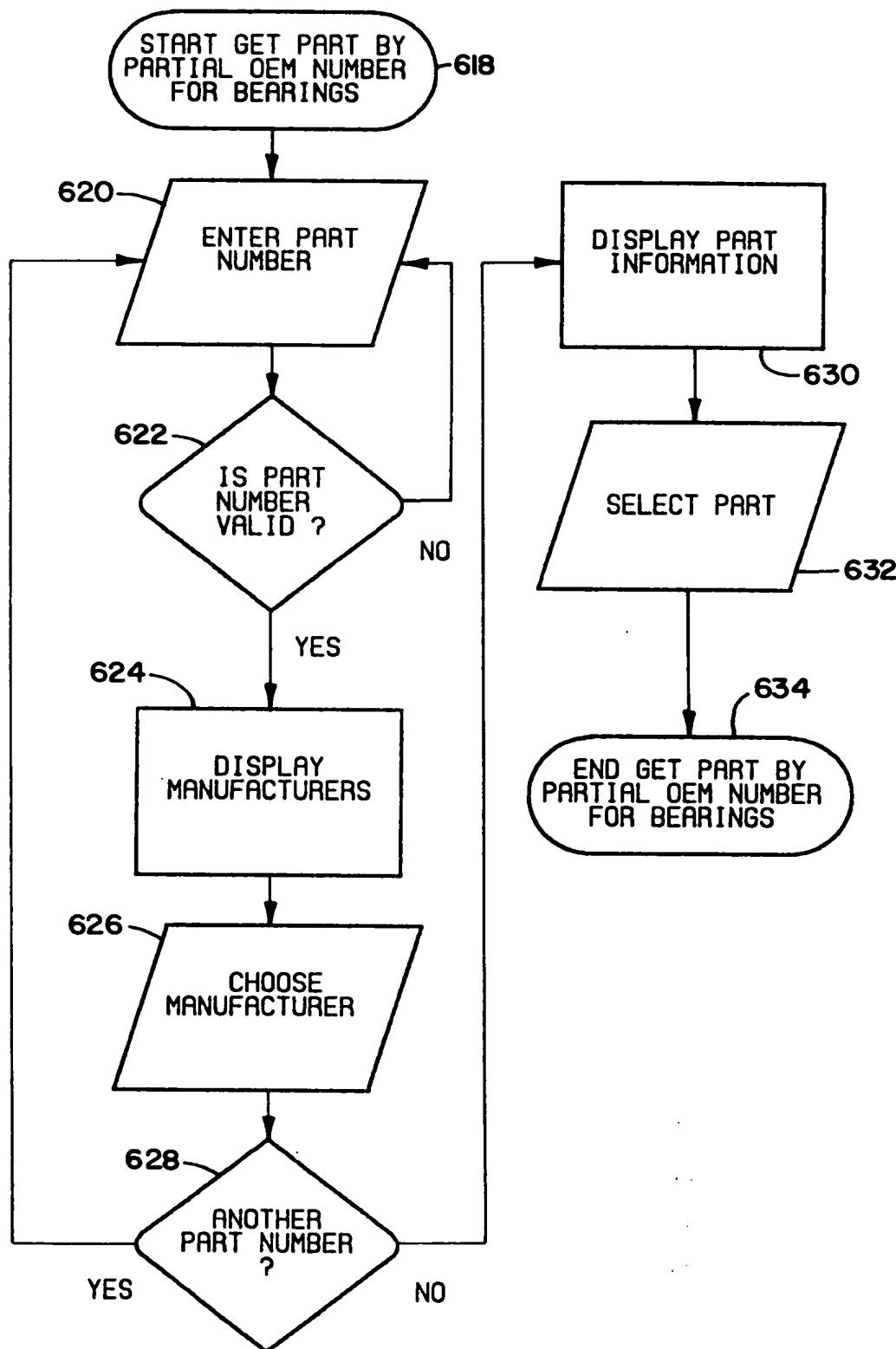
**FIG. 20**



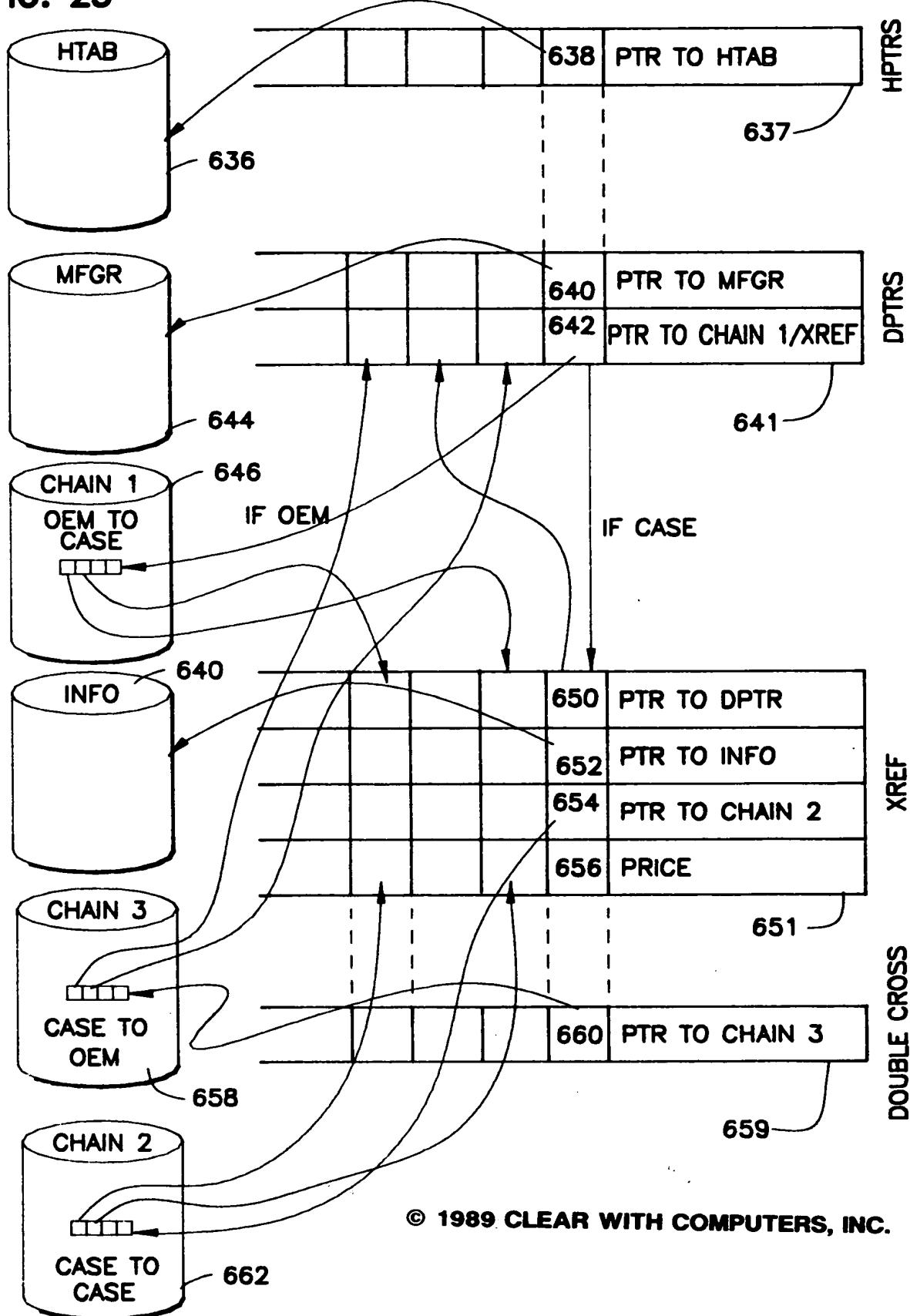


**FIG. 2I**

**FIG. 22**

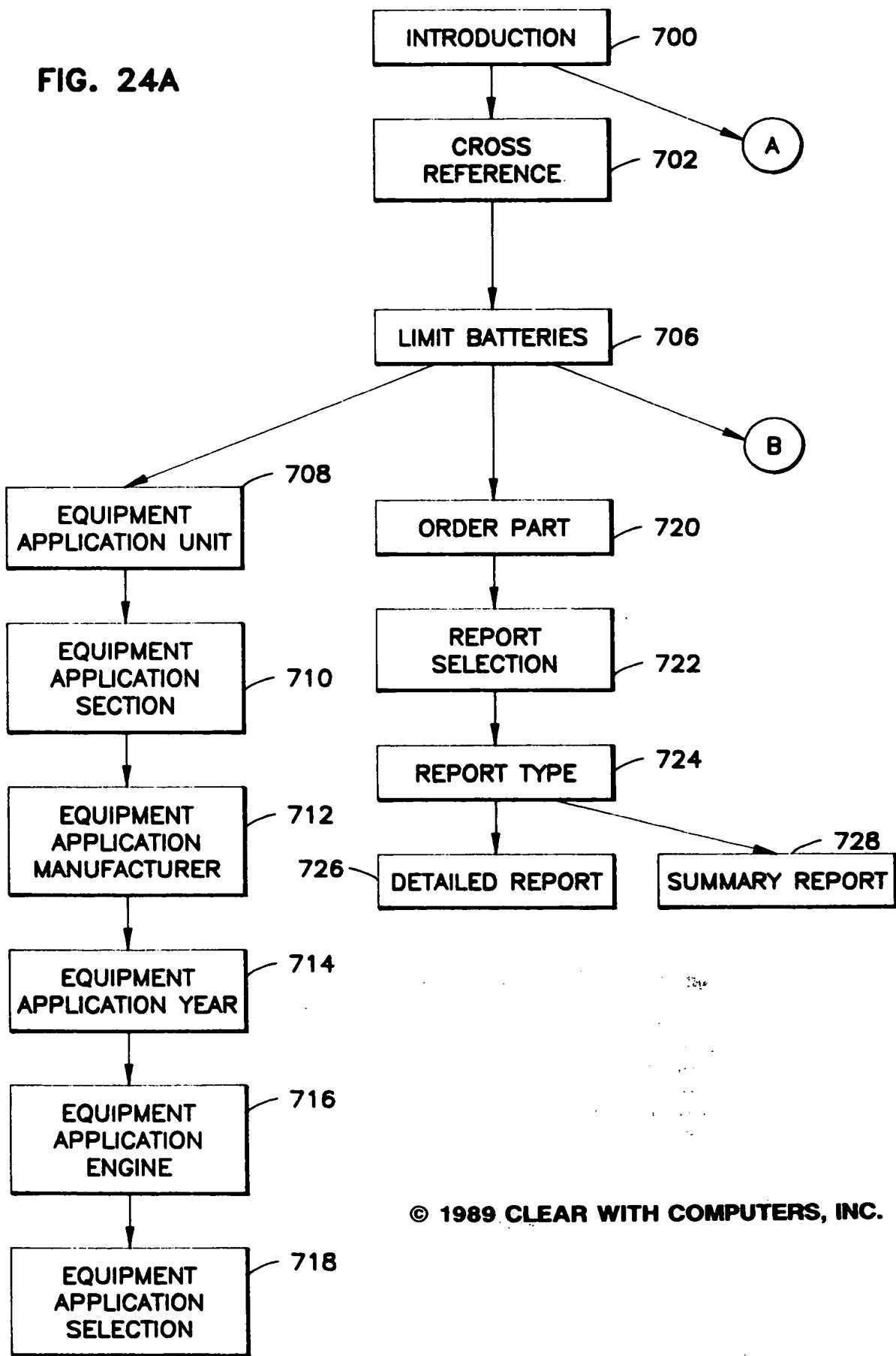


**FIG. 23**



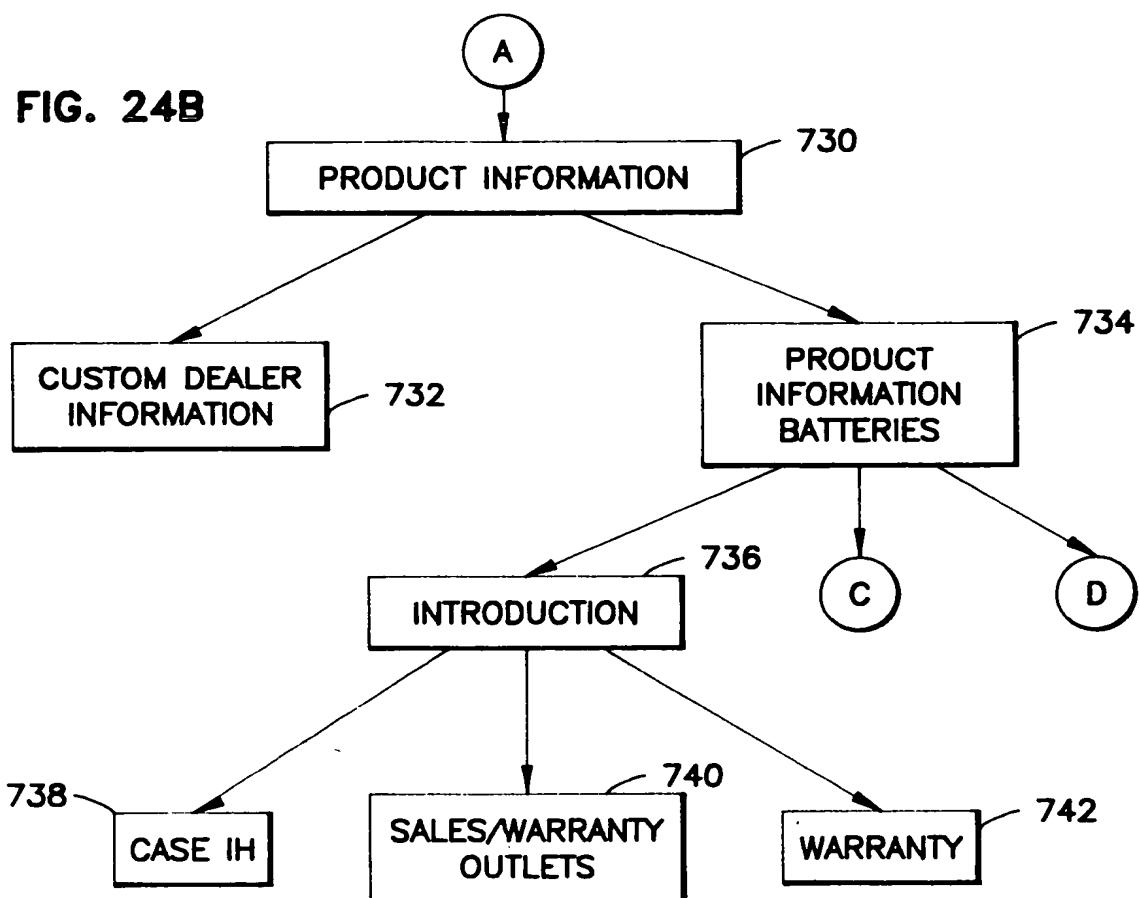
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**FIG. 24A**

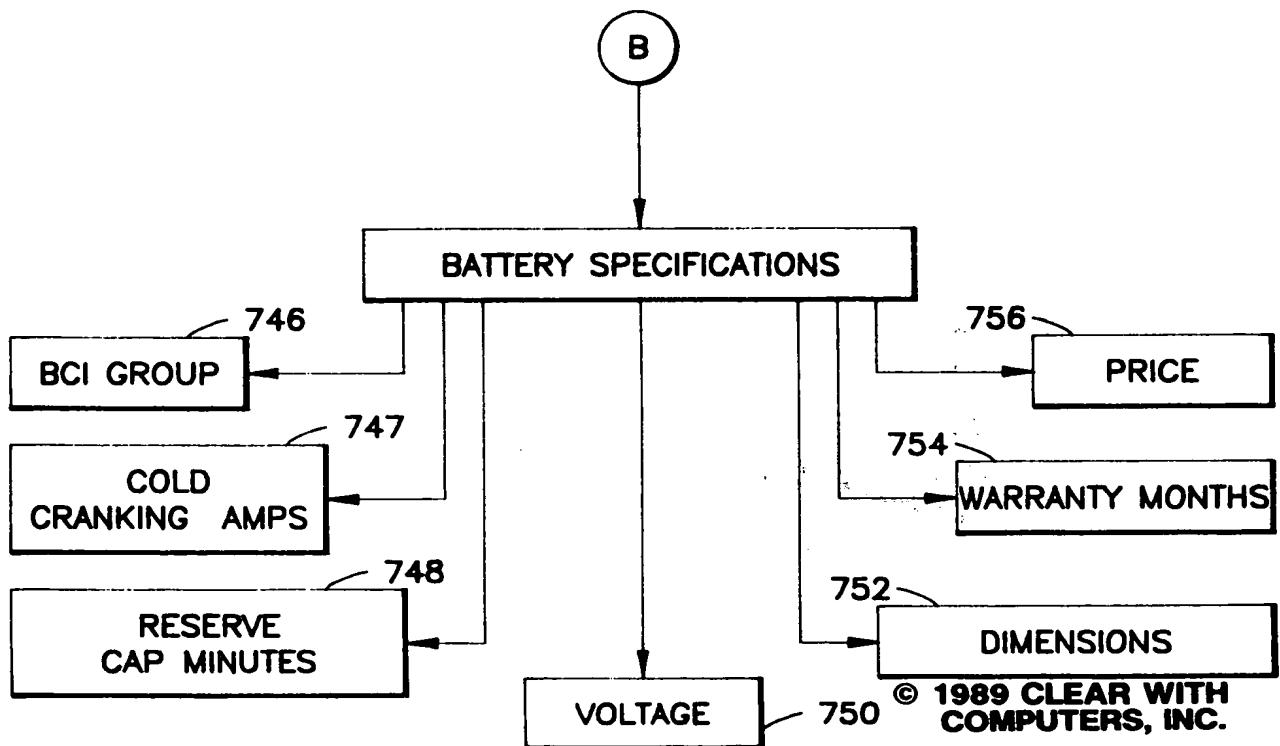


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**FIG. 24B**

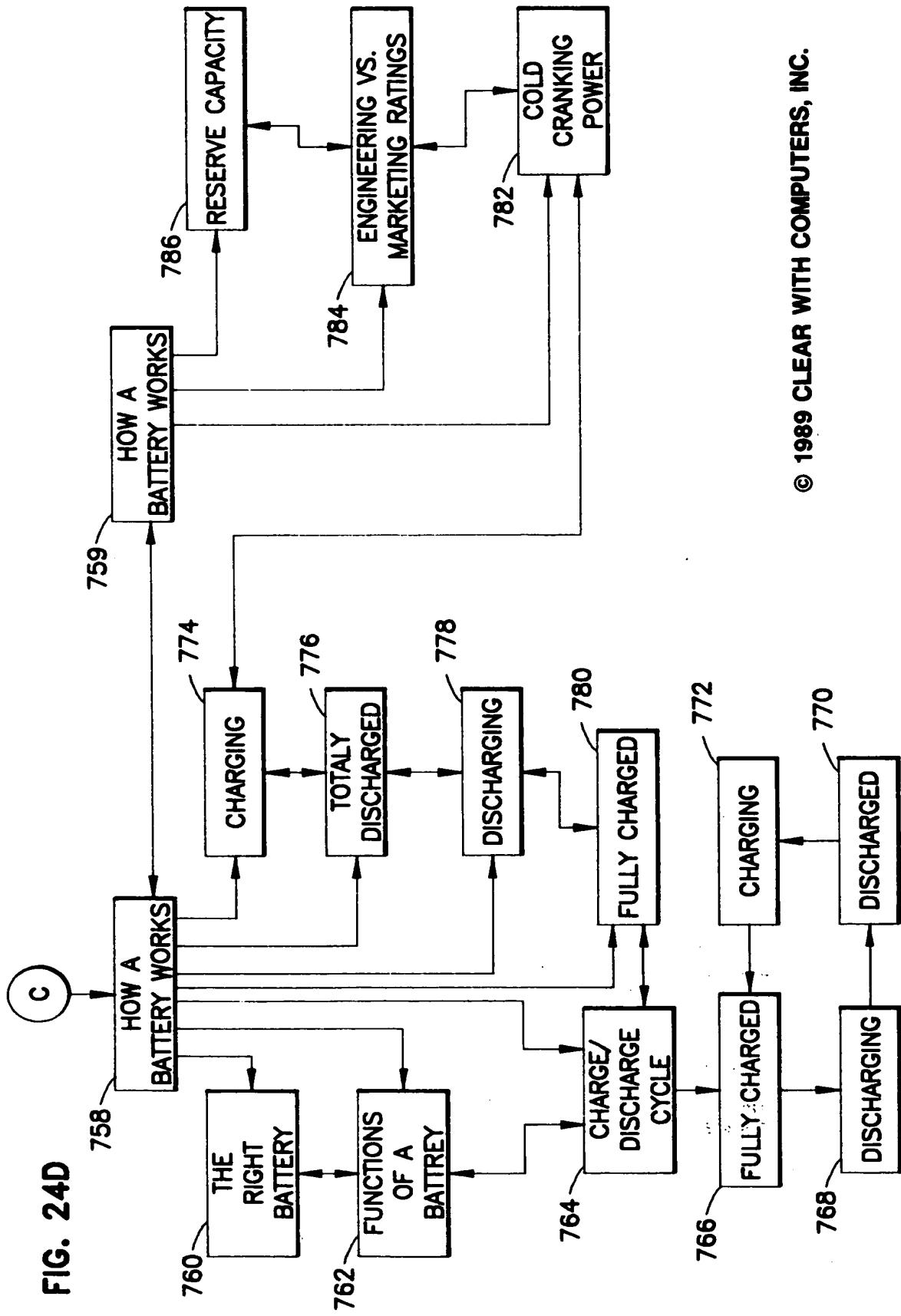


**FIG. 24C**



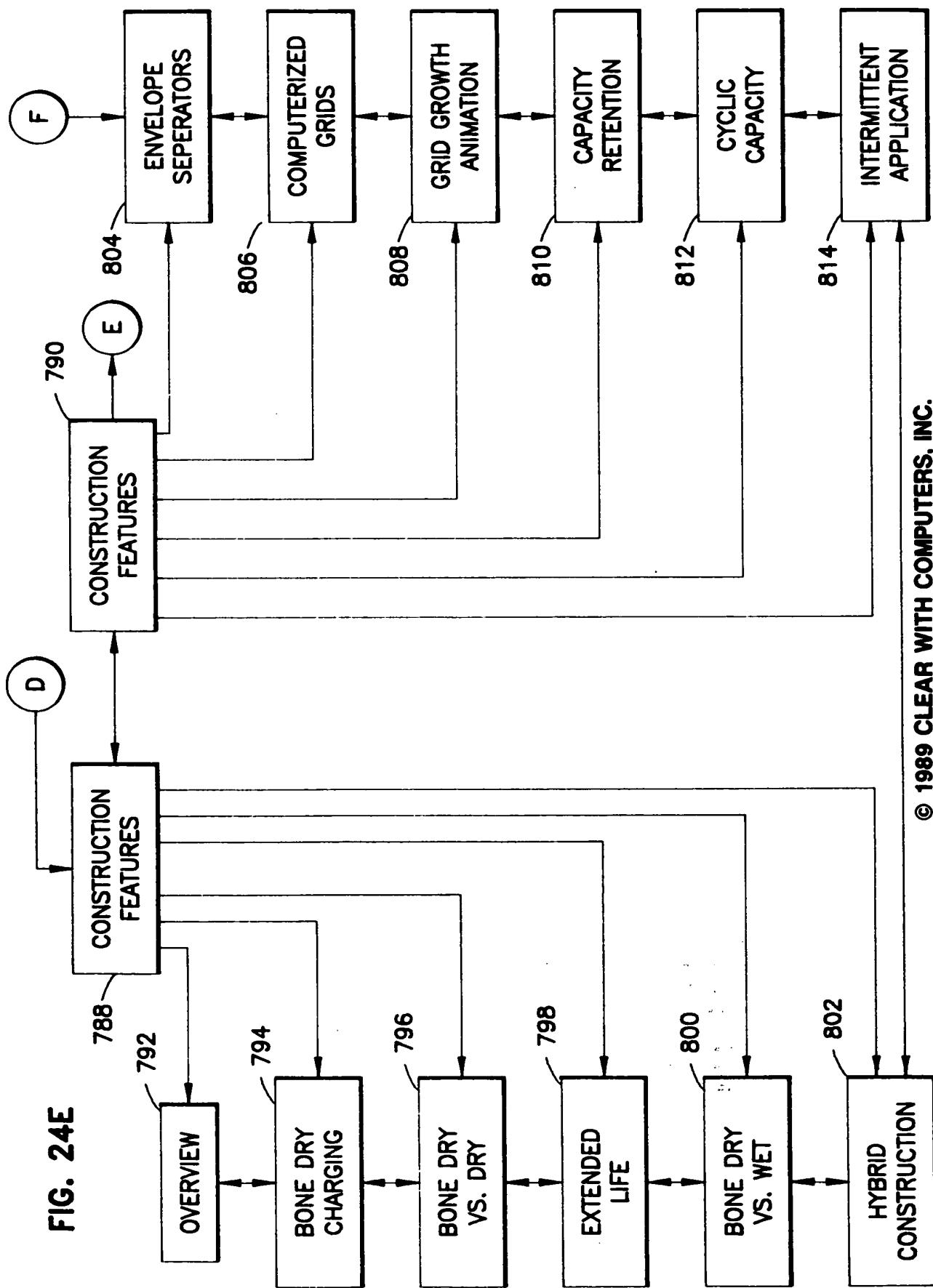
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**FIG. 24D**



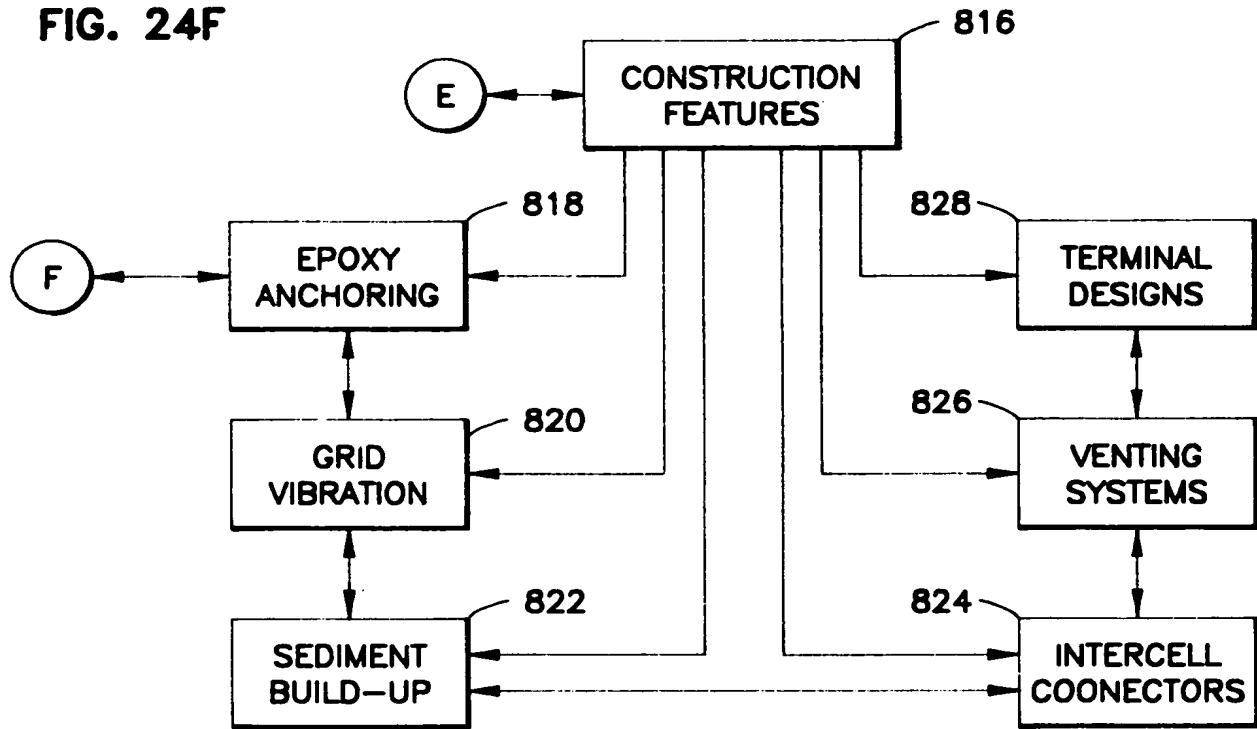
© 1989 CLEAR WITH COMPUTERS, INC.

**FIG. 24E**

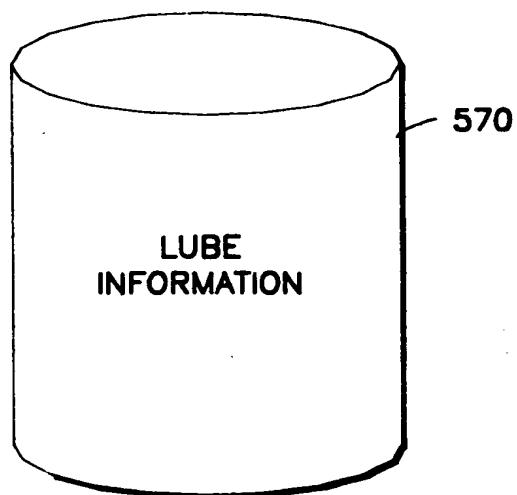


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**FIG. 24F**



**FIG. 18**



**FIG. 25**

CASEIH PARTS Introduction	
700	<p>QUICK REFERENCE Cross-Reference Product Information</p> <p>PRESENTATIONS/PROPOSALS Customer Presentation Customer Equipment</p> <p>TIME-SAVING TOOLS</p> <p>GRAPHIC SLIDE SHOW</p> <p>CUSTOMIZE</p> <p>Leave CASS PARTS</p> <p>Cross-Reference</p> <p>Quickly find a part by entering a part number or a description of the equipment the part will fit</p>

**FIG. 26**

CASEIH PARTS Cross-Reference	
702	<p>Batteries</p> <p>Filters</p> <p>Remanufactured Electric</p> <p>Lubrication</p> <p>Bearings</p> <p>Main Menu</p> <p>Batteries</p> <p>Choose a battery by specifying:</p> <p>1) CASE part number OR 2) Equipment Application (make &amp; model) OR 3) Battery Specifications</p>

**FIG. 27**

**7067**

<b>CASEIH PARTS</b> Limit Batteries	
<b>CASEIH PART #</b>  <b>EQUIPMENT APPLICATION</b>  <b>BATTERY SPECIFICATIONS</b>	<b>CASEIH PART #</b>  Specify the CASEIH Part number for the battery you wish to select.  BCI Group Cold Cranking Amps Reserve Cap Minutes Voltage Dimensions (inches) Warranty Months Price
<p>Press right arrow when lit to go to order screen.</p>	

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**FIG. 28**

708

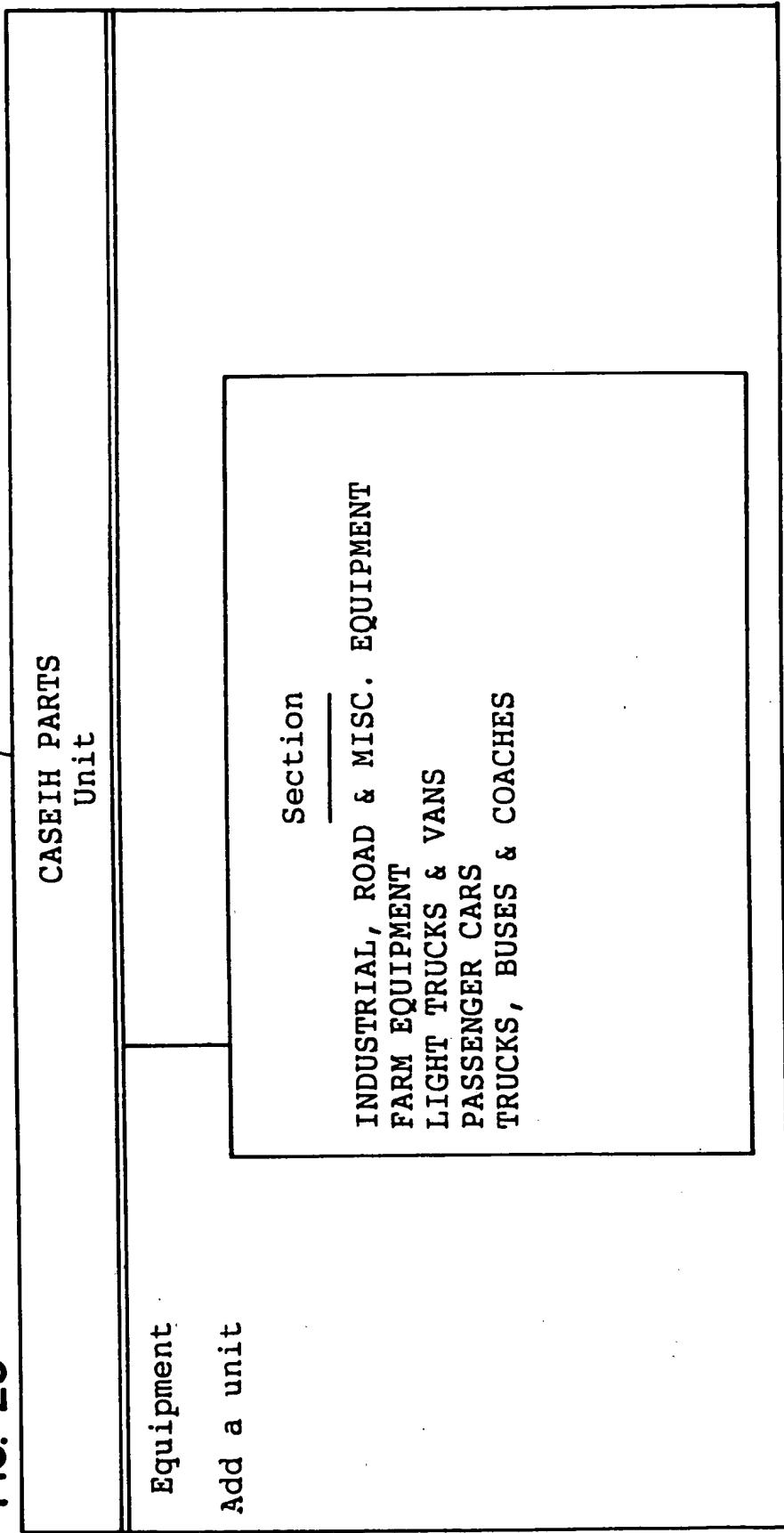
CASEIH PARTS  
Unit

Equipment  
Add a unit

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**FIG. 29**

710



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**FIG. 30**

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CASEIH PARTS Unit				
Equipment	Add a unit			
<table border="1"><tr><td>Manufacturer</td></tr><tr><td>ACURA ALFA ROMEO ACADIAN (GM CANADA) AMERICAN MOTORS AMC/EAGLE/RENAULT AUDI AUSTIN AUSTIN HEALEY AUTO UNION-DKW BEAUMONT (GM CANADA)</td></tr><tr><td>1 of 7</td></tr></table>		Manufacturer	ACURA ALFA ROMEO ACADIAN (GM CANADA) AMERICAN MOTORS AMC/EAGLE/RENAULT AUDI AUSTIN AUSTIN HEALEY AUTO UNION-DKW BEAUMONT (GM CANADA)	1 of 7
Manufacturer				
ACURA ALFA ROMEO ACADIAN (GM CANADA) AMERICAN MOTORS AMC/EAGLE/RENAULT AUDI AUSTIN AUSTIN HEALEY AUTO UNION-DKW BEAUMONT (GM CANADA)				
1 of 7				

**FIG. 3I**

**74**

CASEIH PARTS Unit													
Equipment	<table border="1"><tr><td>Year</td></tr><tr><td>1970-77</td></tr><tr><td>1970-79</td></tr><tr><td>1973-74</td></tr><tr><td>1974-77</td></tr><tr><td>1974-79</td></tr><tr><td>1975-76</td></tr><tr><td>1978-79</td></tr><tr><td>1978-81</td></tr><tr><td>1980-81</td></tr><tr><td>1982</td></tr><tr><td>1 of 2</td></tr></table>	Year	1970-77	1970-79	1973-74	1974-77	1974-79	1975-76	1978-79	1978-81	1980-81	1982	1 of 2
Year													
1970-77													
1970-79													
1973-74													
1974-77													
1974-79													
1975-76													
1978-79													
1978-81													
1980-81													
1982													
1 of 2													
Add a unit													

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**FIG. 32**

716

CASEIH PARTS Unit	
Equipment	Units
	PASS
AUDI	All
Add a unit	
	Manu
	Type
	Mode
	Year
	Engi
	Engine
	—
	80
	ALL OTHERS
	OPTIONAL

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**FIG. 33**

718

CASEIH PARTS		Equipment	Manufacturer	Type	Model	Year	Engine	Units
Unit	PASSENGER CARS							
AUDI	ALL	Add a unit	AUDI	ALL	All Models	1970-77	80	

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**FIG. 34**

720

CASEIH PARTS Limit Batteries							
42	12V	66 Plates	390 CC	50 MO	1 Battery(s)	on unit	
42	12V	66 Plates	390 CC	50 MO	1 Battery(s)	on unit	
42	12V	66 Plates	390 CC	50 MO	1 Battery(s)	on unit	
42	12V	66 Plates	390 CC	50 MO	1 Battery(s)	on unit	
AUDI	ALL MODELS	1970-77 ALL OTHERS	Cold Cranking @ 0 deg F (min)	390 AMPS			
			3.6 Qts Acid	18 lbs dry	27 lbs wet		
			Dimensions (in)	9.31 x 6.87 x 6.87			
				90 day full replacement, 50 Mo Warranty			
			PART NUMBER:	B4250	\$ 46.99		
						© 1989 CLEAR WITH COMPUTERS, INC.	721

**FIG. 35**

(722

CASEIH PARTS Limit Batteries						
42	12V	66 Plates	390 CC	50 MO 1 Battery(s)	on unit	
42	12V	66 Plates	390 CC	50 MO 1 Battery(s)	on unit	
42	12V	66 Plates	390 CC	50 MO 1 Battery(s)	on unit	
<input type="button" value="Report Selection"/>						
<ol style="list-style-type: none"><li>1. Proposal/Order</li><li>2. Comparision</li><li>3. Application</li></ol>						
<b>AUDI ALL MODELS 1970-77</b> Cold Cranking @ 0 deg F (min) 390 AMPS 3.6 Qts Acid 18 lbs dry 27 lbs wet Dimensions (in) 9.31 x 6.87 x 6.87 90 day full replacement, 50 Mo Warranty						
PART NUMBER: B4250 \$ 46.99						

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**FIG. 36**

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CASEIH PARTS Limit Batteries						
42	12V	66 Plates	390 CC	50 MO 1	Battery(s)	on unit
42	12V	66 Plates	390 CC	50 MO 1	Battery(s)	on unit
42	12V	66 Plates	390 CC	50 MO 1	Battery(s)	on unit
Report Type						
<hr/>						
1. Detailed						
2. Summary						
AUDI	ALL MODELS	1970-77 ALL OTHERS	Cold Cranking @ 0 deg F (min)	390	AMPS	
			3.6 Qts Acid	18 lbs dry	27 lbs wet	
			Dimensions (in)	9.31 x 6.87	x 6.87	
			90 day full replacement,	50 Mo Warranty		
PART NUMBER: B4250						\$ 46.99

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**FIG. 37****PROPOSAL / ORDER**

726

QTY	PART NUMBER	DESCRIPTION	PRICE EA (\$)	PRICE TOTAL (\$)
-----	-------------	-------------	---------------	------------------

**BATTERY:**

1 B4250 42 12V 66 Plates 390 CC 50 MO 46.99  
 AUDI ALL MODELS 1970-77 ALL OTHERS  
 Cold Cranking @ 0 deg F (min) 390 AMPS  
 3.6 Qts Acid 18 lbs dry 27 lbs wet  
 Dimensions (in) 9.31 x 6.87 x 6.87  
 90 day full replacement, 50 Mo Warranty

**S U M M A R Y**

Quantity	Product	Price
1	BATTERY	\$ 46.99
	BATTERY Subtotal:	\$ 46.99
	Total:	\$ 46.99

X \_\_\_\_\_

Accepted by: \_\_\_\_\_

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**FIG. 38****PROPOSAL / ORDER**

QTY	PART NUMBER	DESCRIPTION	PRICE EA (\$)	PRICE TOTAL (\$)
-----	-------------	-------------	---------------	------------------

728

**BATTERY:**

1	B4250	42	12V 66 Plates 390 CC 50 MO	46.99
	AUDI	ALL MODELS	1970-77 ALL OTHERS	46.99

SUMMARY		
Quantity	Product	Price
1	BATTERY	\$ 46.99
	BATTERY Subtotal:	\$ 46.99
	Total:	\$ 46.99

X \_\_\_\_\_

X \_\_\_\_\_

X \_\_\_\_\_

Accepted by: \_\_\_\_\_

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**FIG. 39**

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CASEIH PARTS Limit Batteries	
CASEIH PART #  EQUIPMENT APPLICATION  BATTERY SPECIFICATIONS	<p>BATTERY SPECIFICATIONS</p> <hr/> <p>Choose which battery specification categories are to be used to limit battery choice.</p> <hr/> <p>Multiple categories can be used.</p> <hr/> <p>BCI GROUP</p> <hr/> <p>Specify the BCI Group you wish to select a battery from.</p> <hr/> <p>Press right arrow when lit to go to order screen.</p>

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**FIG. 40**

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CASEIH PARTS Limit Batteries		BATTERY SPECIFICATIONS
<b>CASEIH PART #</b>  <b>EQUIPMENT APPLICATION</b>  <b>BATTERY SPECIFICATIONS</b>  BCI Group Cold Cranking Amps Reserve Cap Minutes Voltage Dimensions (inches) Warranty Months Price	Choose which battery specification categories are to be used to limit battery choice.  Multiple categories can be used.	<hr/> <b>Cold Cranking Amps</b> <hr/> Specify the Cold Cranking Amps the battery must deliver. <hr/> Press right arrow when lit to go to Order screen.

**FIG. 41**

**748**

<p>CASEIH PARTS Limit Batteries</p>	<p>BATTERY SPECIFICATIONS</p>	<p>Choose which battery specification categories are to be used to limit battery choice.</p>	<p>Multiple categories can be used.</p>	<p>Reserve Capacity Minutes</p>	<p>Specify the Reserve Capacity Minutes the battery must deliver.</p>	<p>Press right arrow when lit to go to order screen.</p>
<p>EQUIPMENT APPLICATION</p>	<p>BATTERY SPECIFICATIONS</p>	<p>BCI Group Cold Cranking Amps Reserve Cap Minutes Voltage Dimensions (inches) Warranty Months Price</p>				

**FIG. 42**

(750)

CASEIH PARTS	
CASEIH PART #	Limit Batteries
EQUIPMENT APPLICATION	BATTERY SPECIFICATIONS
BATTERY SPECIFICATIONS	Choose which battery specification categories are to be used to limit battery choice.
BCI Group	Multiple categories can be used.
Cold Cranking Amps	Voltage
Reserve Cap Minutes	Specify the required voltage the battery must have.
Voltage	
Dimensions (inches)	
Warranty Months	
Price	Press right arrow when lit to go to order screen.

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**FIG. 43**

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CASEIH PARTS Limit Batteries	
CASEIH PART #	BATTERY SPECIFICATIONS
EQUIPMENT APPLICATION	Choose which battery specification categories are to be used to limit battery choice. Multiple categories can be used.
BATTERY SPECIFICATIONS	Dimensions (inches)
BCI Group	Will locate battery(s) of exact size
Cold Cranking Amps	or if not exact size, available
Reserve Cap Minutes	battery(s) whose 3 measurements are
Voltage	within 1/2 inch smaller.
Dimensions (inches)	
Warranty Months	
Price	

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**FIG. 44**

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CASEIH PARTS Limit Batteries		BATTERY SPECIFICATIONS
CASEIH PART #	Choose which battery specification categories are to be used to limit battery choice.	
EQUIPMENT APPLICATION	Multiple categories can be used.	
BATTERY SPECIFICATIONS	Warranty Months	
BCI Group	Specify the number of months the	
Cold Cranking Amps	battery must be covered by warranty.	
Reserve Cap Minutes		
Voltage		
Dimensions (inches)		
Warranty Months		
Price		
Press right arrow when lit to go to order screen.		

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**FIG. 45**

756

<p>CASEIH PART #</p> <p>EQUIPMENT APPLICATION</p> <p>BATTERY SPECIFICATIONS</p> <p>BCI Group Cold Cranking Amps Reserve Cap Minutes Voltage Dimensions (inches) Warranty Months Price</p>	<p>CASEIH PARTS Limit Batteries</p> <p>BATTERY SPECIFICATIONS</p> <p>Choose which battery specification categories are to be used to limit battery choice.</p> <p>Multiple categories can be used.</p> <p>Price</p> <p>Specify the desired target price of the battery.</p> <p>Press right arrow when lit to go to order screen.</p>	<p>© 1989 CLEAR WITH COMPUTERS, INC.</p>
---	--	--

**FIG. 46**

CASEIH PARTS Facts, the CASEIH story	
730—	DEALER NAME  BATTERIES  FILTERS  REMANUFACTURED ELECTRIC  LUBRICANTS  BEARINGS   Main Menu
	DEALER NAME <hr/> Customized information for this dealership

**FIG. 47**

CASEIH PARTS Facts, the CASEIH story	
732—	DEALER NAME  BATTERIES  FILTERS  REMANUFACTURED ELECTRIC  LUBRICANTS  BEARINGS   Main Menu
	DEALER NAME <hr/> Background  Parts  Service

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WITH  
COMPUTERS,  
INC.

50

**FIG. 48**

734

CASEIH PARTS Facts, the CASEIH story	
DEALER NAME	BATTERIES
BATTERIES	Introduction
FILTERS	How a Battery Works
REMANUFACTURED ELECTRIC	Construction Features
LUBRICANTS	
BEARINGS	
Main Menu	

**FIG. 49**

736

CASEIH  
Sales/Warranty Outlets

**CASEIH**  
Batteries  
for every  
purpose



Headquartered in Racine, WI, CASE IH is a worldwide manufacturer and marketer of agricultural and construction equipment. CASE IH is a subsidiary of Tenneco, Inc.



Headquartered in Houston, TX, Tenneco Inc., is a diversified company with major business interests in oil, natural gas, pipelines, agricultural and construction equipment, ship building, automotive parts, chemicals, packaging, agriculture, and minerals.

FIG. 50

738

FIG. 51

740

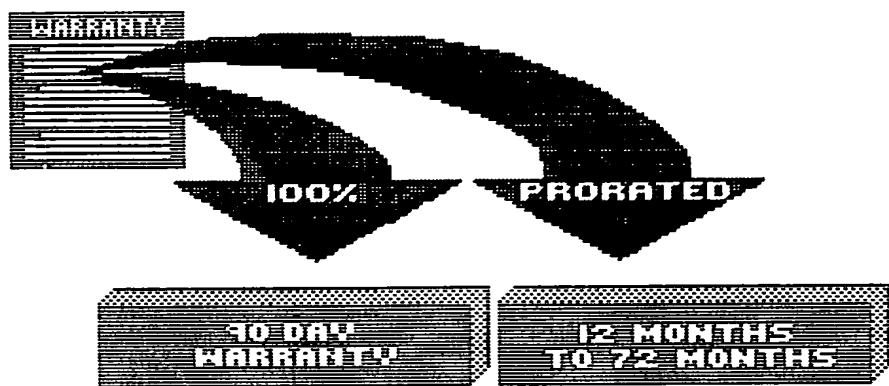
CASE IH NORTH AMERICA



- + CASE IH insures parts availability and warranty service through its many sales outlets all across North America

FIG. 52

742

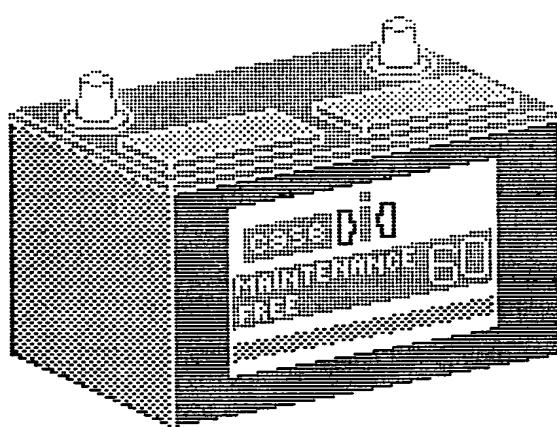


\* **WARRANTY**

- + CASE IH stands behind their batteries with the best warranty in the industry, regardless of vehicle application

FIG. 53

758



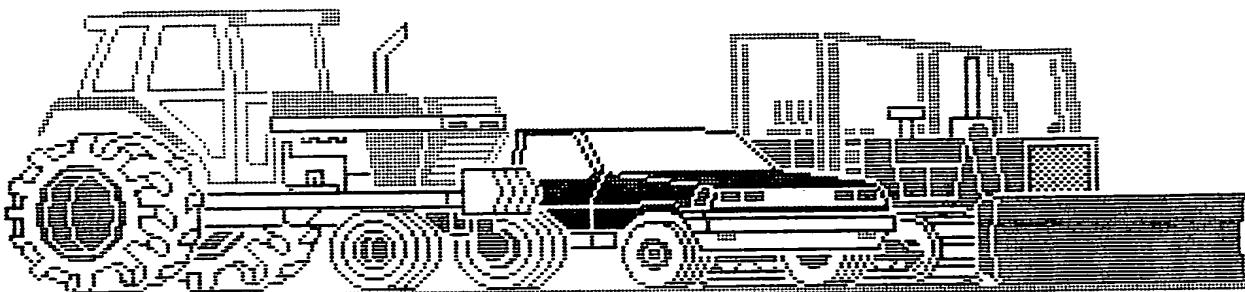
Batteries  
for every  
purpose

The Right Battery  
Functions of a Battery  
Charge/Discharge Cycle  
Fully Charged  
Discharging  
Totally Discharged  
Charging

Screen 1 of 2

**FIG. 54**

760

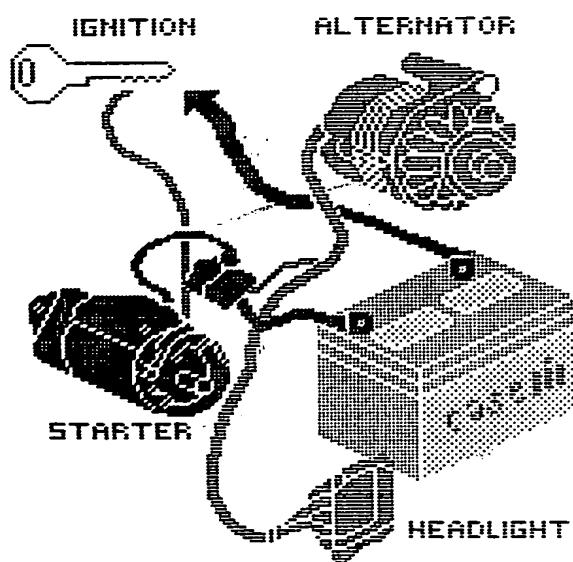


**\* THE RIGHT BATTERY FOR YOUR NEEDS**

- + A wide selection of quality batteries, made in North America by skilled craftsmen, provide superior performance features for almost any application

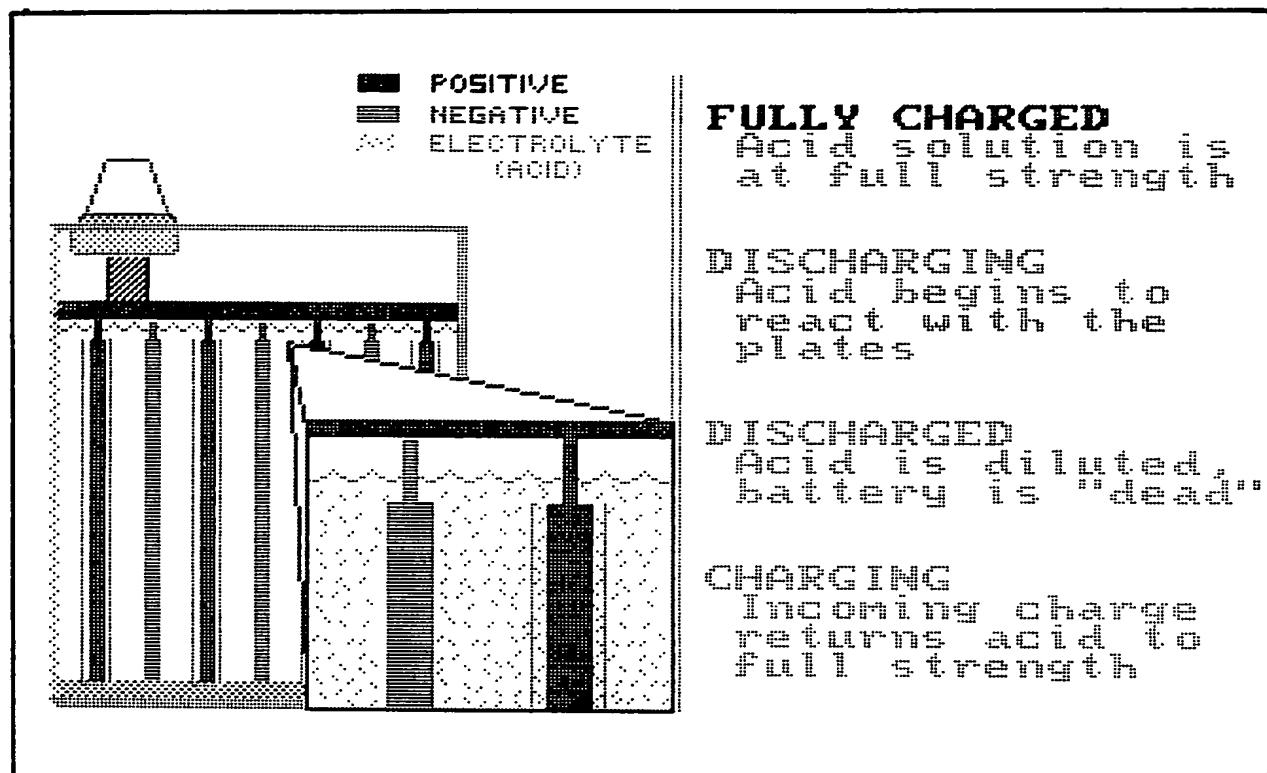
**FIG. 55**

762



**MAIN FUNCTIONS OF THE BATTERY**

- 1) Supply power to starter and ignition system
- 2) Supply extra power when vehicle's electrical load requirements exceed supply from charging system
- 3) Protect electrical system from temporarily high voltages

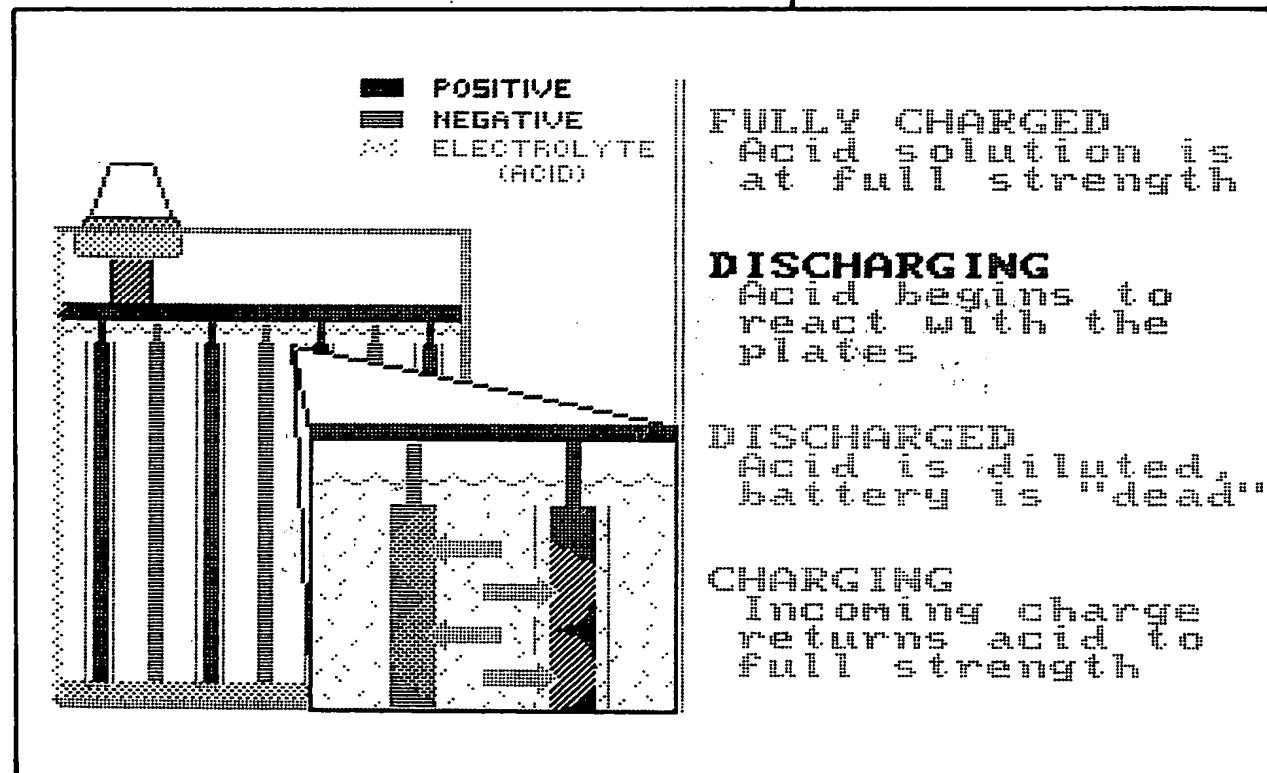


**FIG. 56**

766

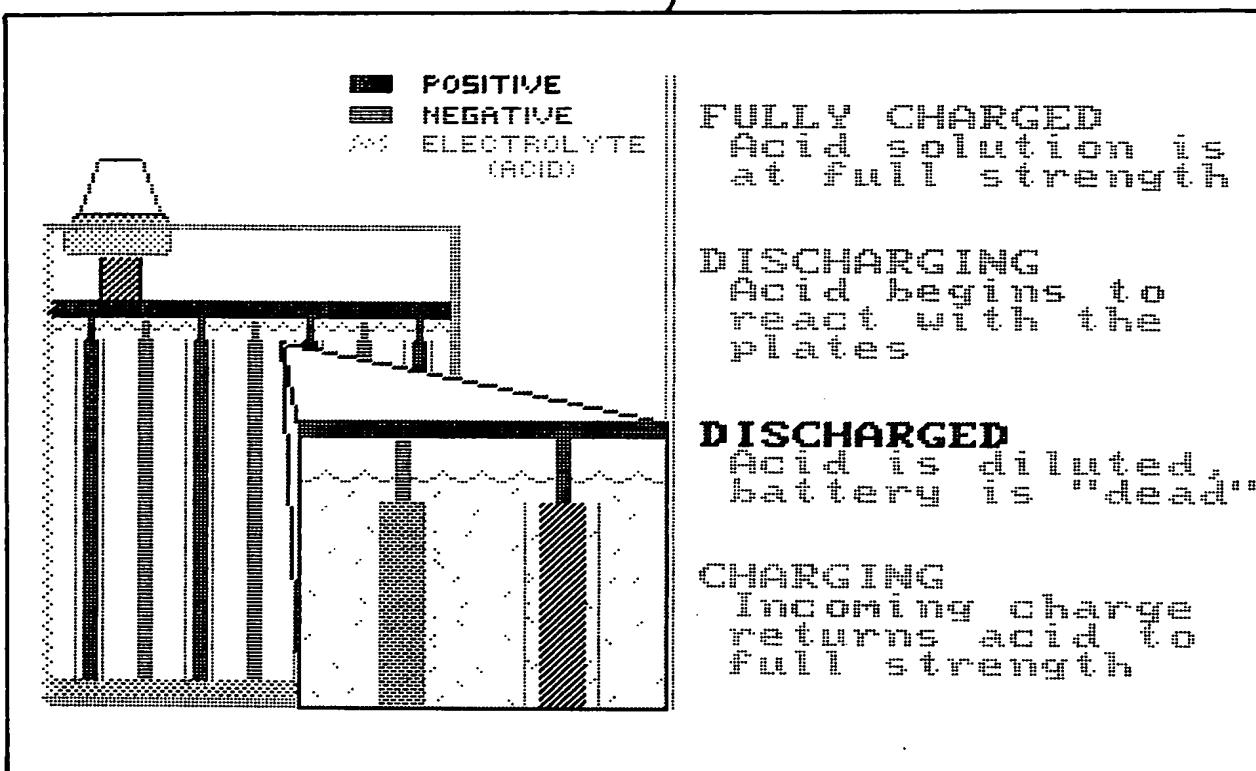
**FIG. 57**

768



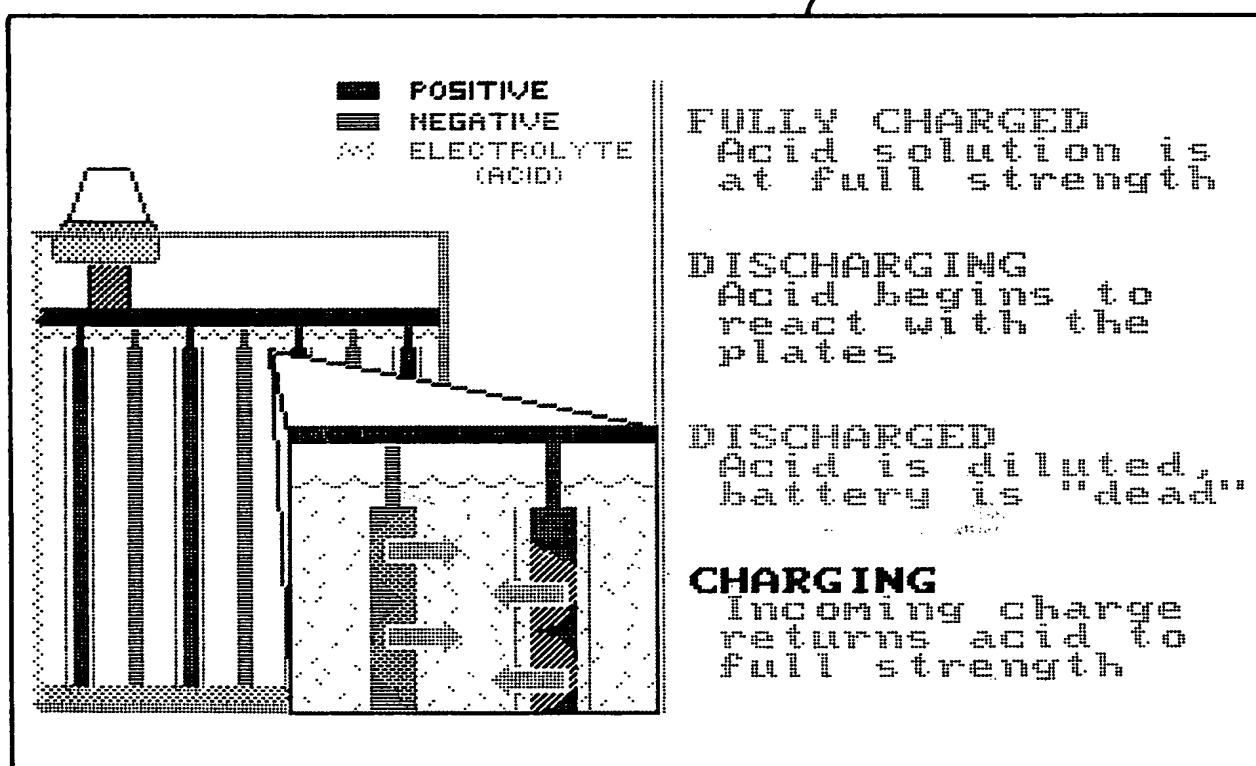
**FIG. 58**

770)



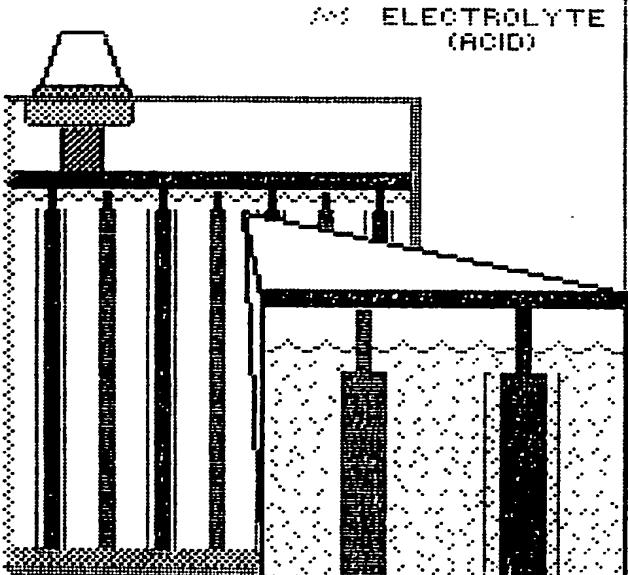
**FIG. 59**

772)



**FIG. 60**

780



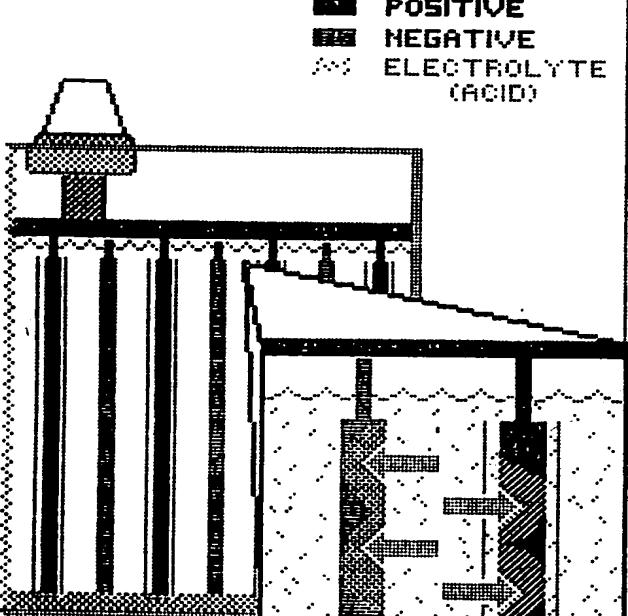
**FULLY CHARGED**

**Electrolyte**

( acid ) in battery  
is at full strength  
and plates are  
ready to deliver  
full voltage

**FIG. 61**

778



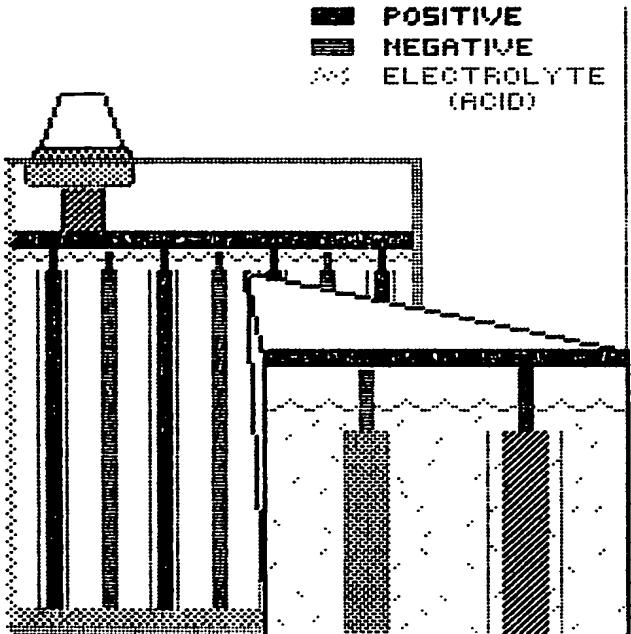
**DISCHARGING**

**Electrolyte**

( acid ) is diluted  
by water produced  
and battery's  
ability to deliver  
a useful voltage is  
lowered

**FIG. 62**

776

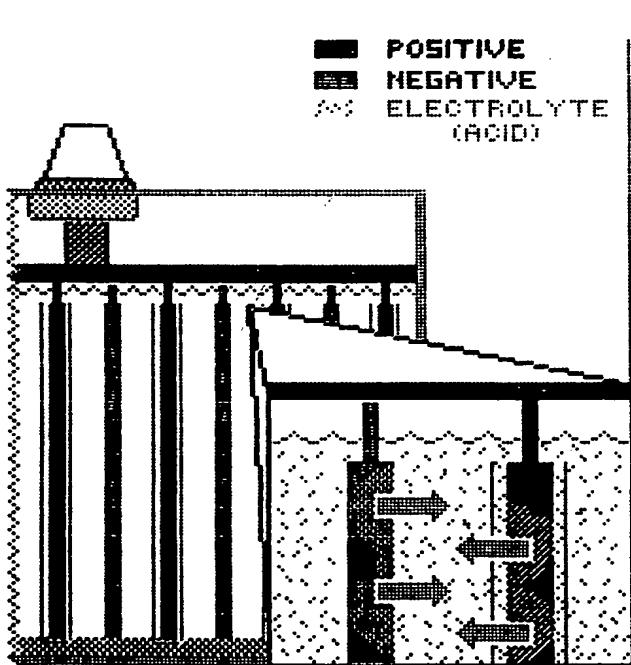


**TOTALLY DISCHARGED**

Water produced  
dilutes electrolyte  
( acid ) to point  
at which battery  
can no longer  
deliver a useful  
voltage

**FIG. 63**

774

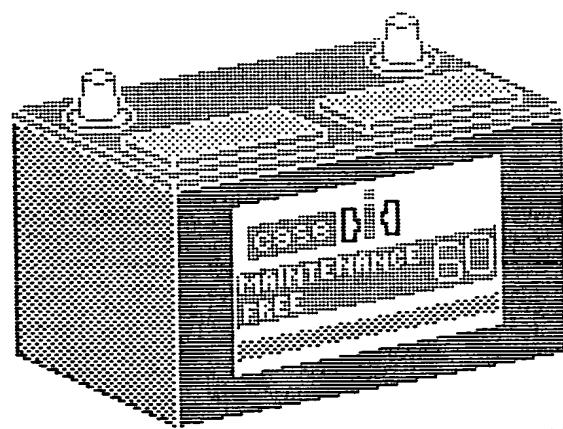


**CHARGING**

Electrical current  
is passed through  
the battery in a  
direction opposite  
to the direction of  
discharge reversing  
the chemical  
reactions that took  
place while battery  
was discharging

FIG. 64

759



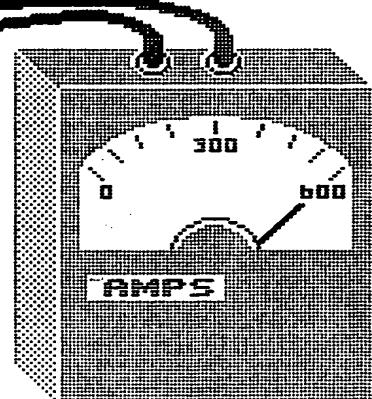
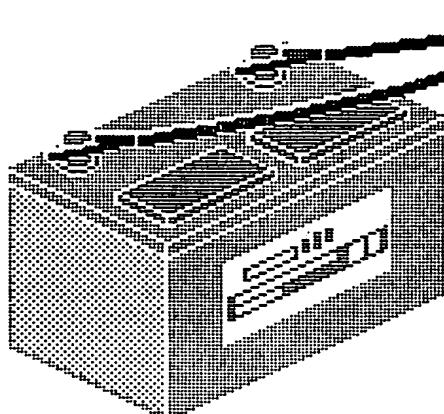
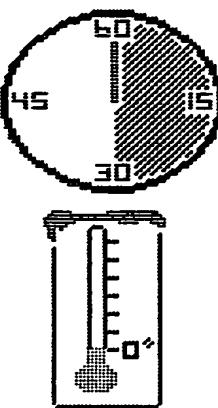
Batteries  
for every  
purpose

Cold Cranking Power  
Engineering vs. Marketing Ratings  
Reserve Capacity

Screen 2 of 2

FIG. 65

782



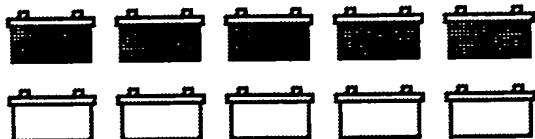
- \* **COLD CRANKING CAPACITY**
- + Amount of current battery can deliver for 30 seconds at 0 degrees without dropping below a specific voltage
- + Ability of battery to provide adequate power to start a cold engine based on manufacturer's standards

## ENGINEERING RATINGS



ENGINEERING RATINGS ACHIEVE  
SAE PERFORMANCE STANDARDS  
**95%**  
OF THE TIME

## MARKETING RATINGS



MARKETING RATINGS ACHIEVE SAE  
PERFORMANCE STANDARDS ONLY  
**50%**  
OF THE TIME

### \* ENGINEERING vs MARKETING RATINGS

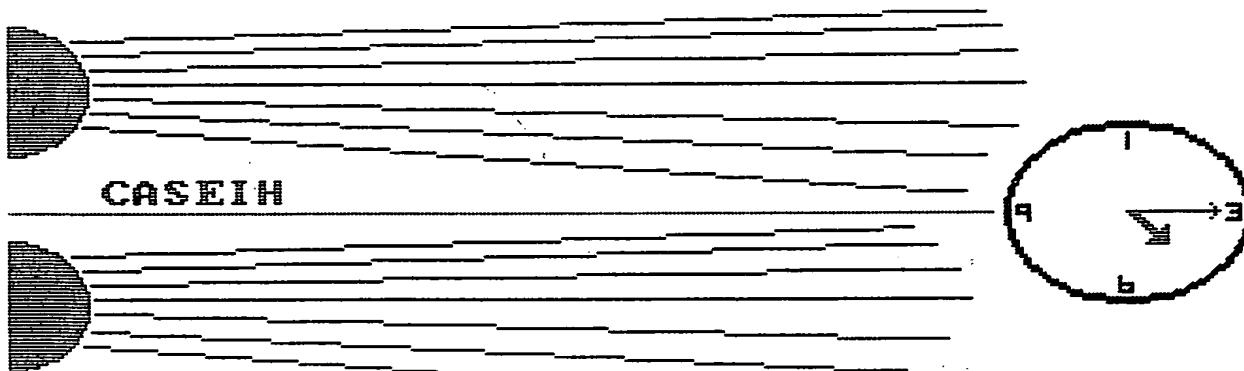
- + CASE IH will accept only engineering ratings
- + CASE IH randomly selects units for tests to insure our high standards are being met
- + Reliable quality is guaranteed

FIG. 66

784

FIG. 67

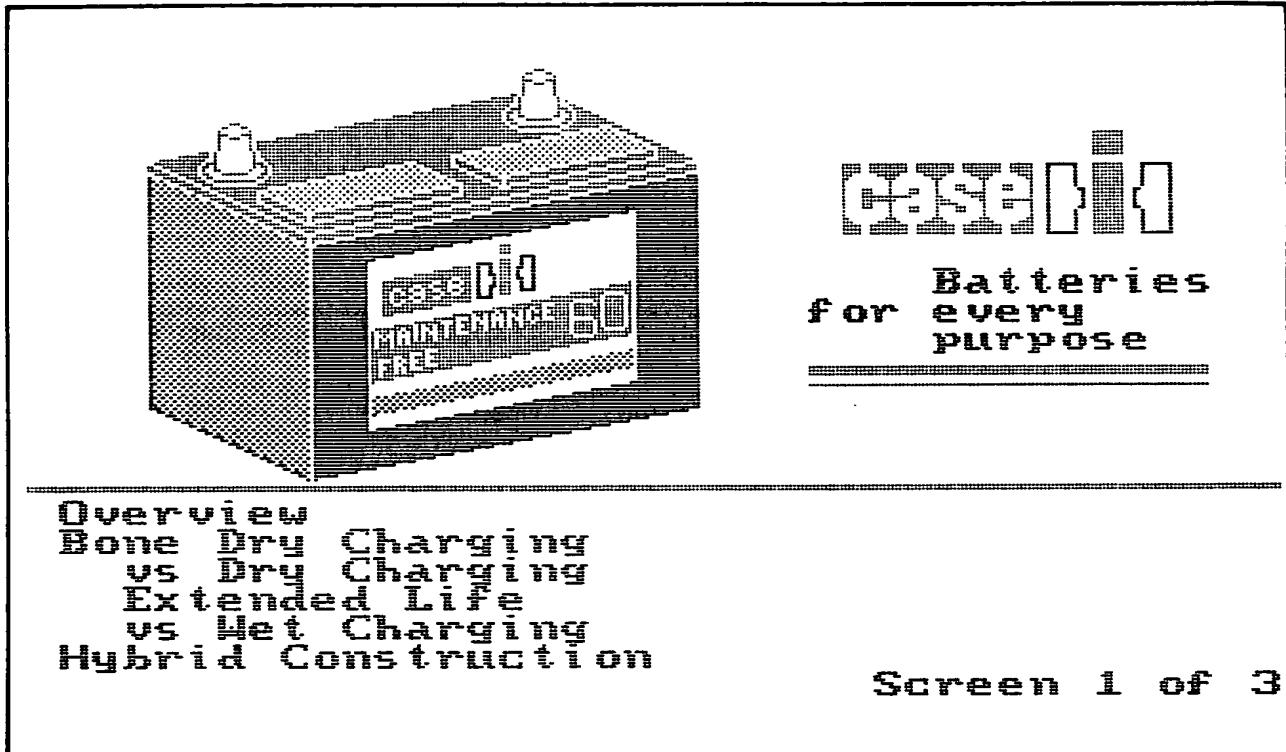
786



## OTHERS

### \* HIGH RESERVE CAPACITY

- + CASE IH batteries have the capacity to deliver a sustained electrical flow if a vehicle's charging system fails
- + Reliable performance in the field



Overview  
Bone Dry Charging  
vs Dry Charging  
Extended Life  
vs Wet Charging  
Hybrid Construction

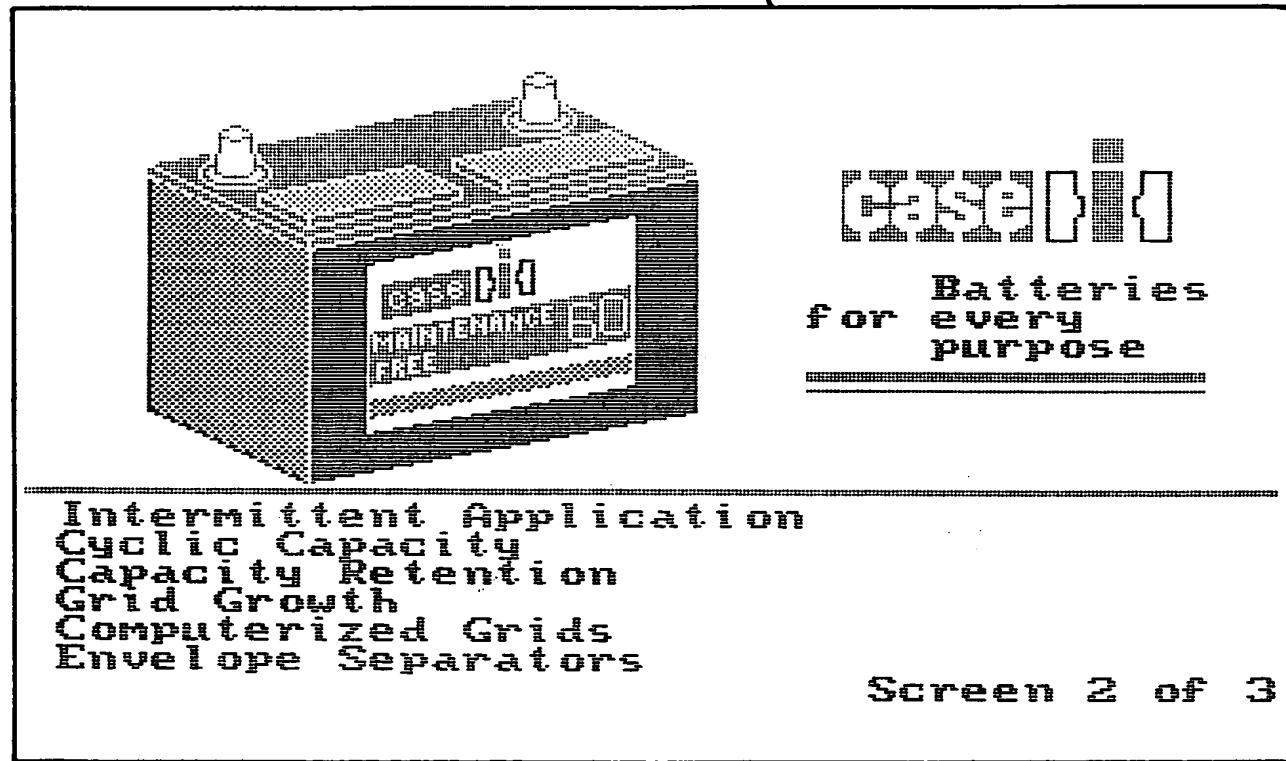
Screen 1 of 3

FIG. 68

788

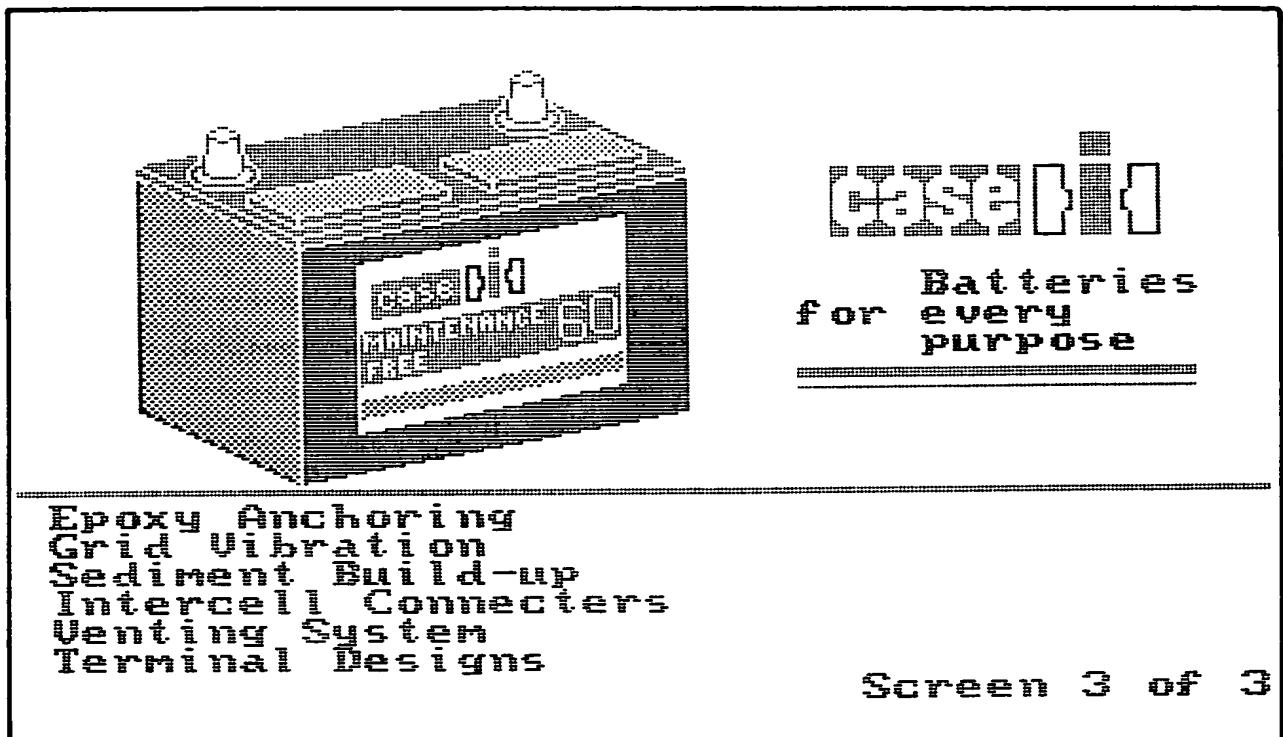
FIG. 69

790



Intermittent Application  
Cyclic Capacity  
Capacity Retention  
Grid Growth  
Computerized Grids  
Envelope Separators

Screen 2 of 3

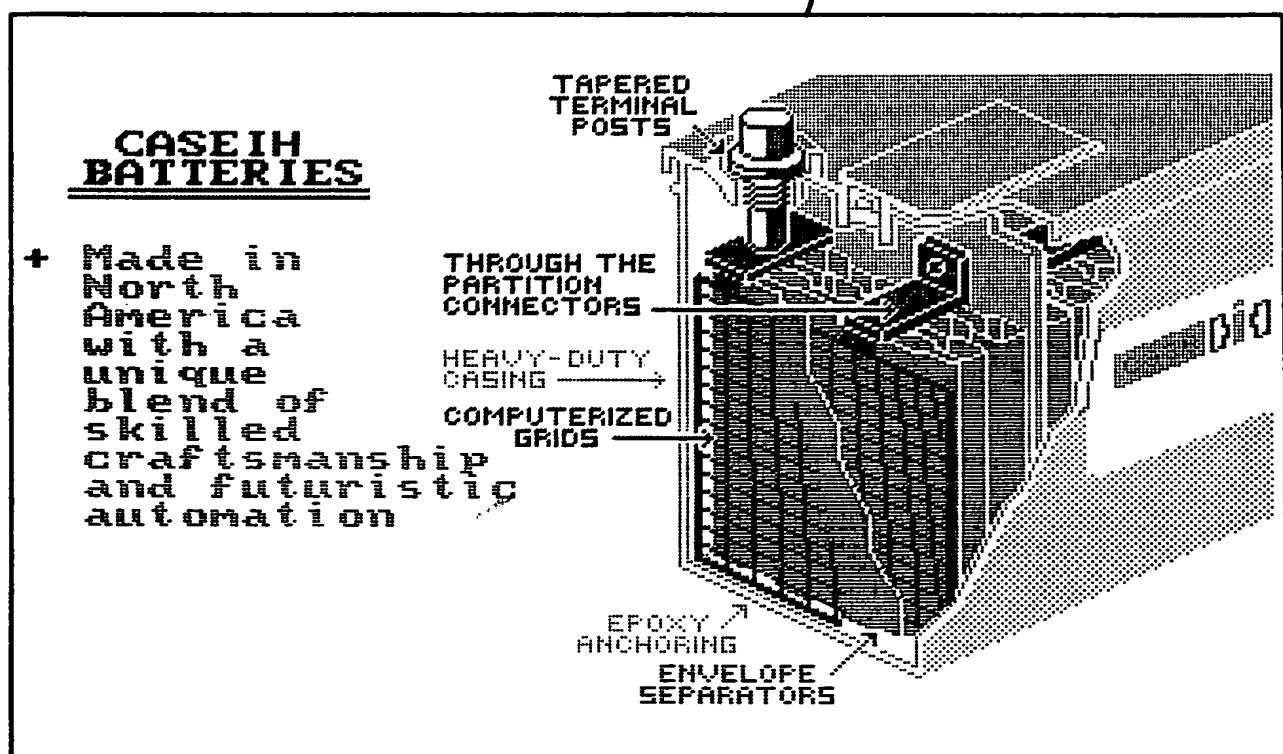


**FIG. 70**

816

**FIG. 71**

792



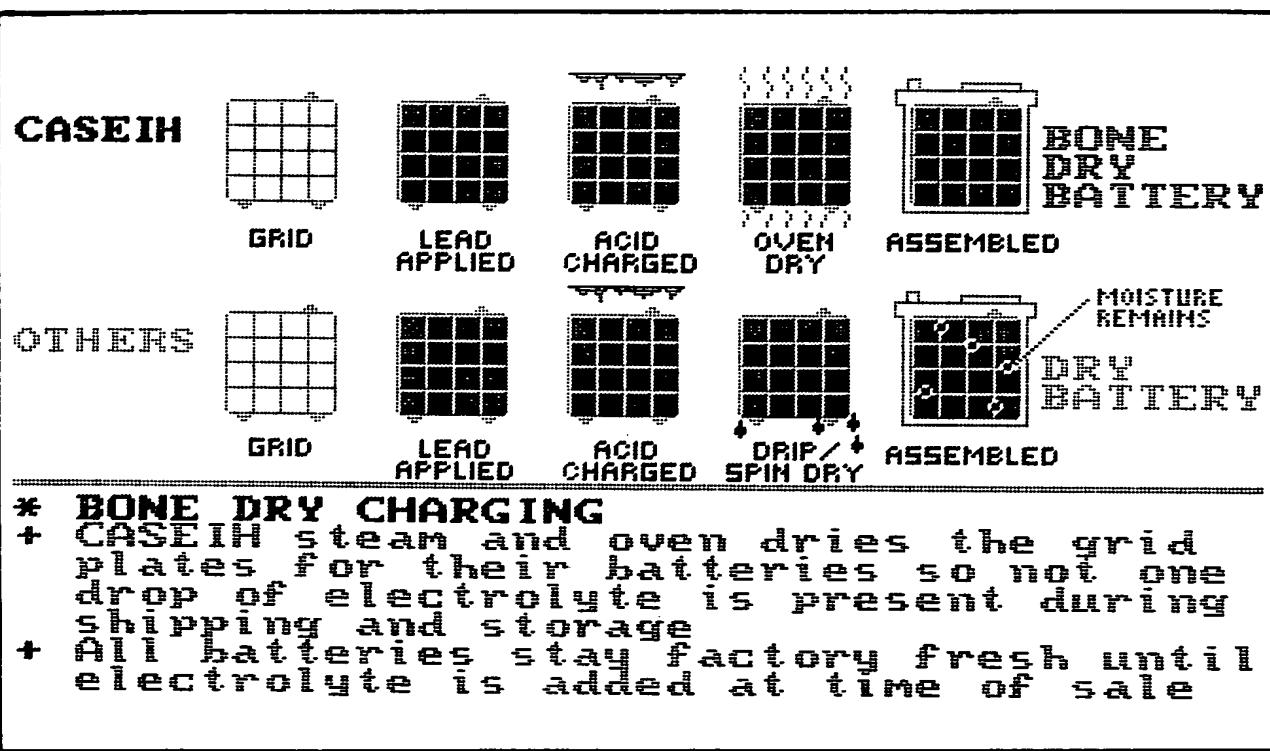
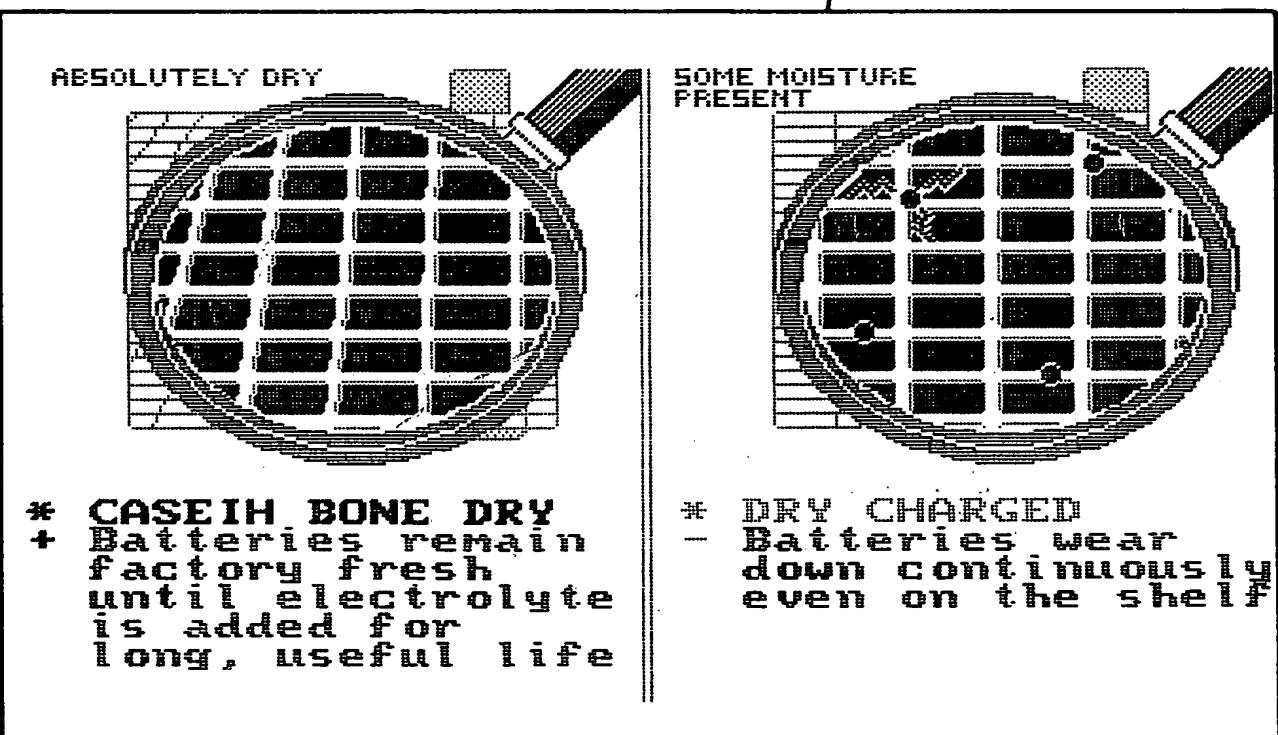


FIG. 72

794

FIG. 73

796



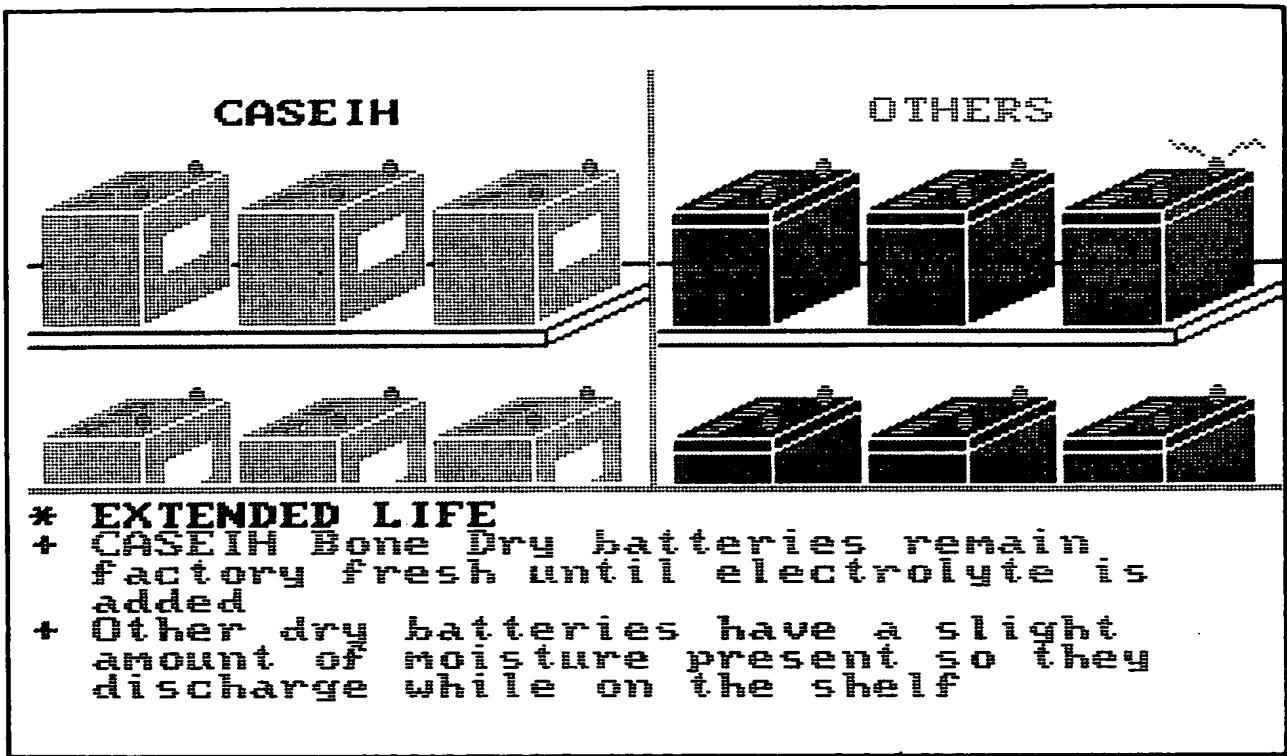
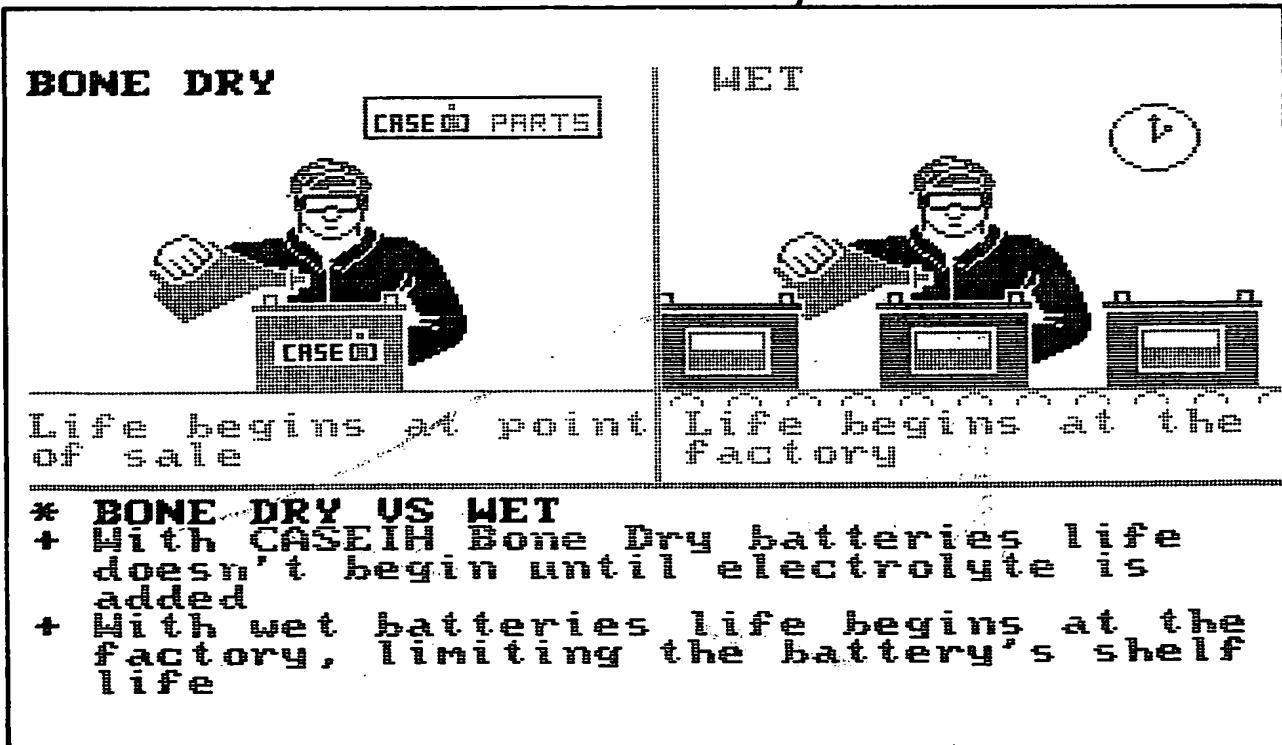


FIG. 74

798

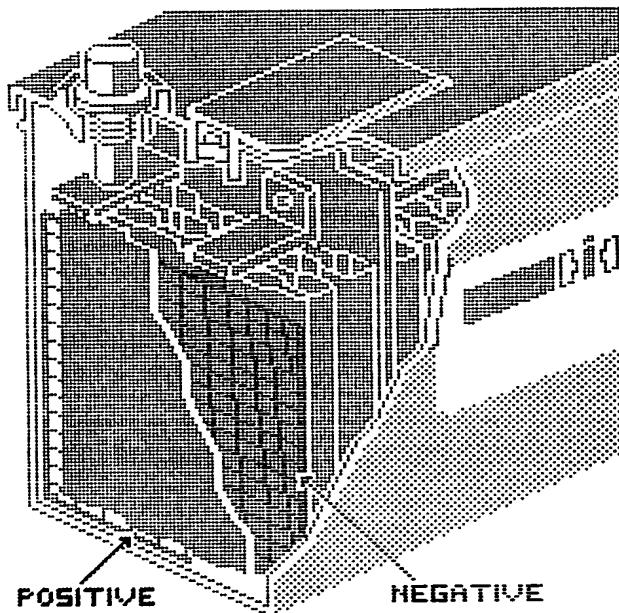
FIG. 75

800



**FIG. 76**

802

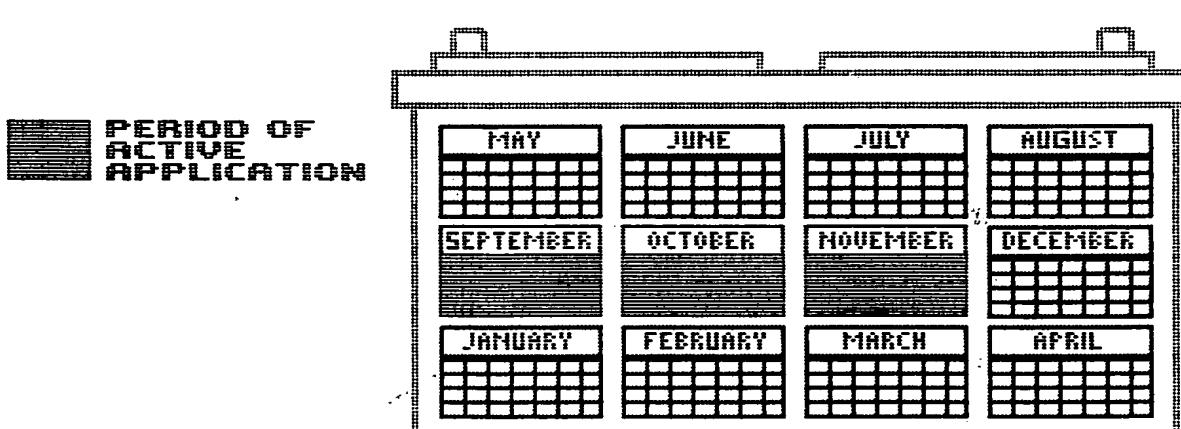


### **HYBRID BATTERY**

- + The term "hybrid battery" means the positive grid alloy is a low antimony-lead alloy and the negative grid alloy is a calcium-lead alloy

**FIG. 77**

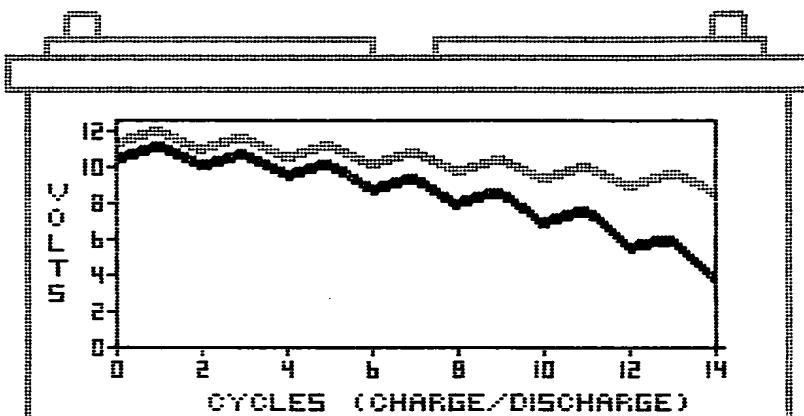
814



### **\* INTERMITTENT APPLICATION**

- + CASEIH hybrid battery is more suitable in starting a vehicle after standing for long periods of inactivity
- + Once the vehicle is started, the hybrid battery will accept charge quickly

— CASEIN HYBRID  
— CALCIUM



#### \* CYCLIC CAPACITY

- + SAE cycle-life test data has shown that hybrid batteries out-perform calcium batteries during moderate depth cycling tests by two to one

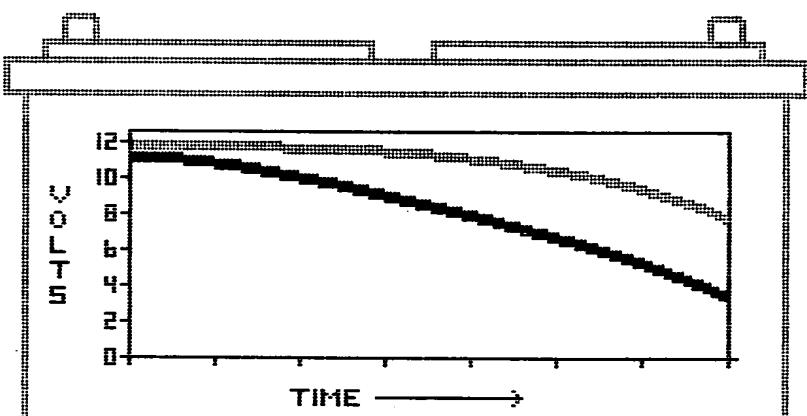
FIG. 78

812

FIG. 79

810

— CASEIN HYBRID  
— CALCIUM

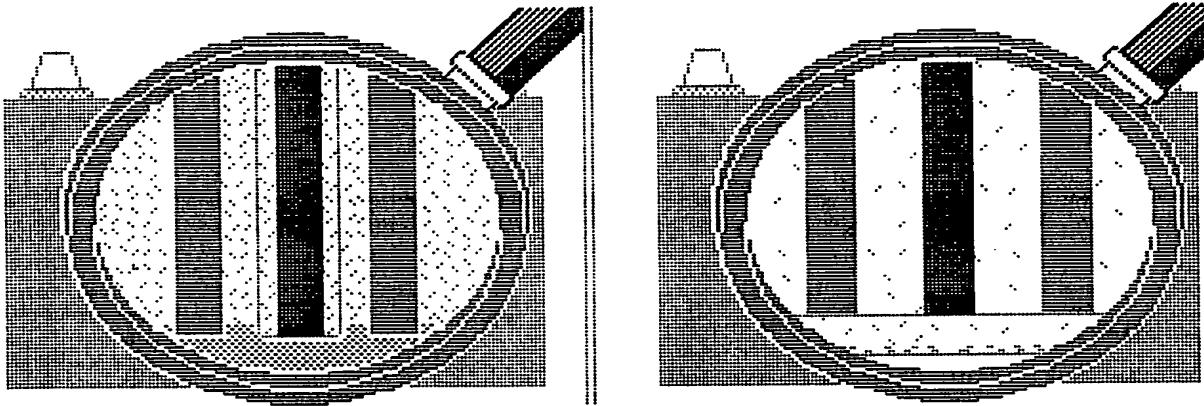


#### \* CAPACITY RETENTION

- + Capacity retention of calcium batteries fades much faster than that of hybrid batteries
- + Active material utilization in hybrid batteries is superior and recovery after a deep discharge more complete

FIG. 80

808-



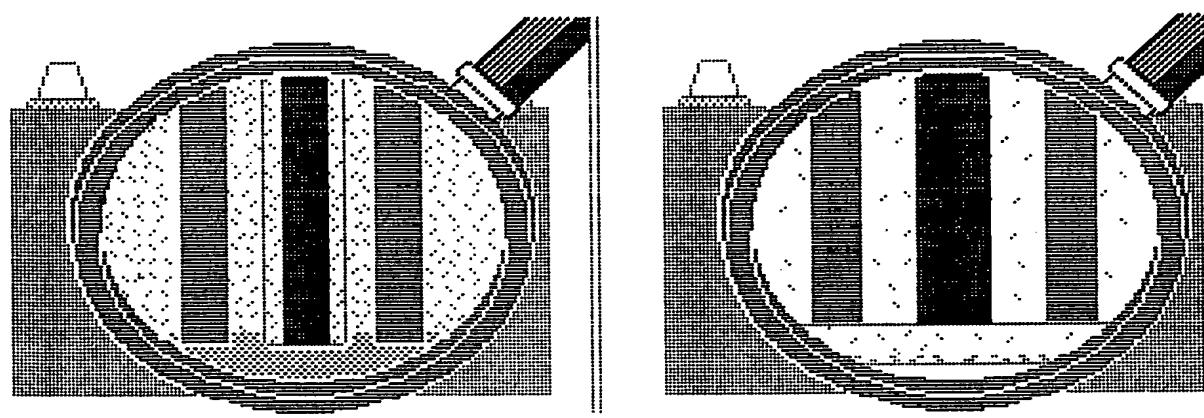
\*\*\* EPOXY BASE ■ POSITIVE □ ELECTROLYTE (ACID) ■ NEGATIVE

\* **GRID GROWTH**

- + Grid corrosion in calcium batteries produces grid growth, which can cause shorting
- + Low antimony positive grids in hybrid batteries have a very low growth rate

FIG. 81

808-



\*\*\* EPOXY BASE ■ POSITIVE □ ELECTROLYTE (ACID) ■ NEGATIVE

\* **GRID GROWTH**

- + Grid corrosion in calcium batteries produces grid growth, which can cause shorting
- + Low antimony positive grids in hybrid batteries have a very low growth rate

FIG. 82

808

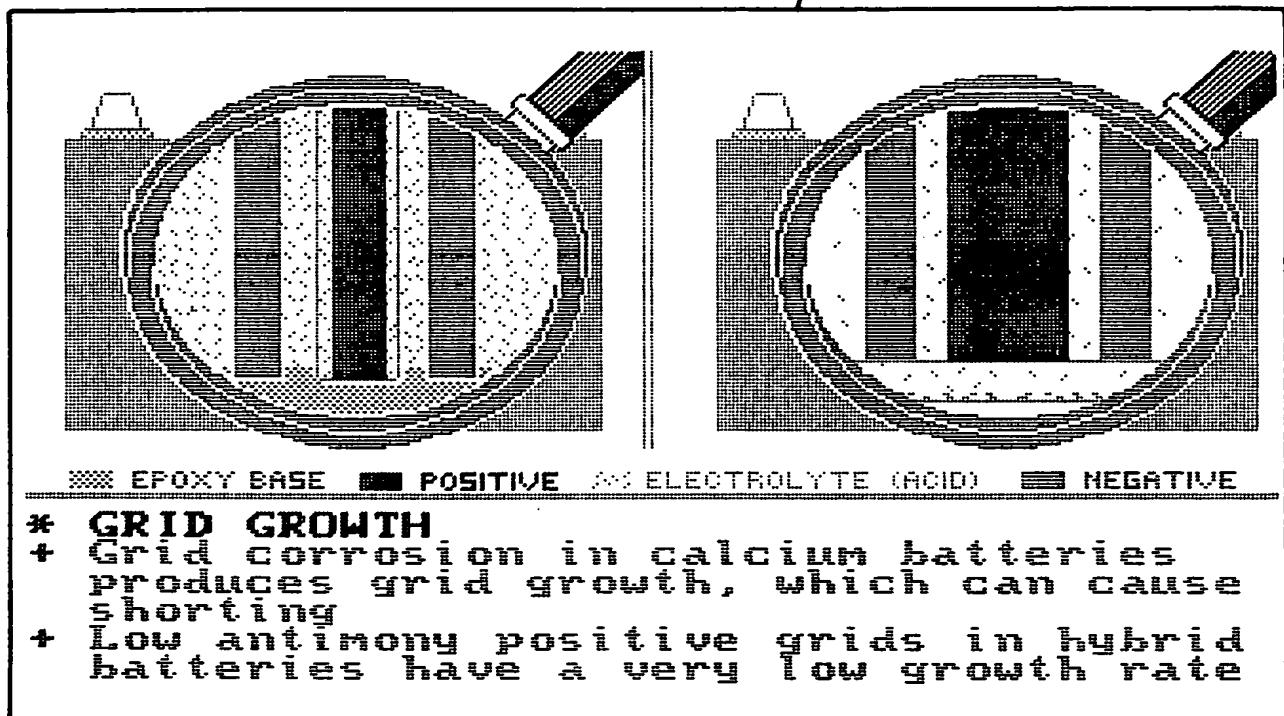


FIG. 83

808

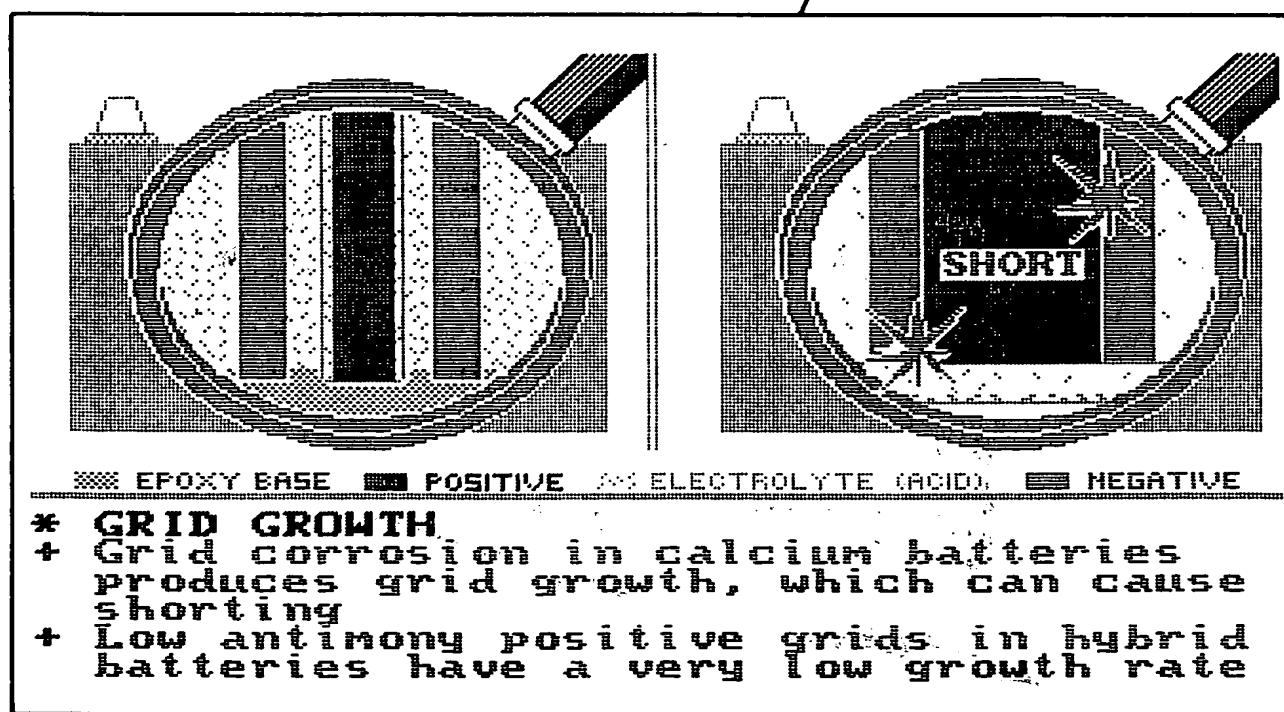
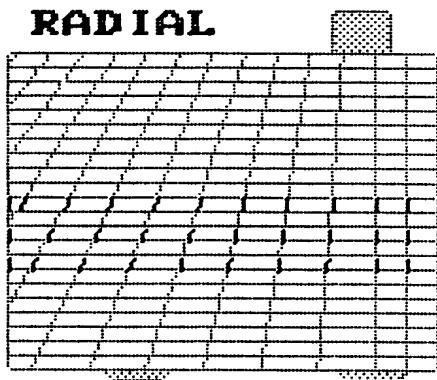


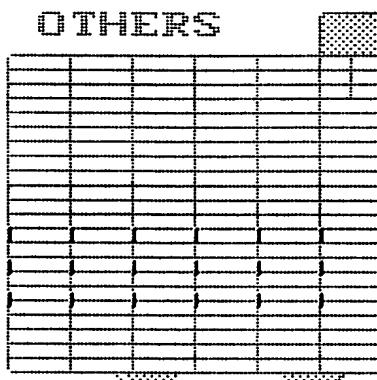
FIG. 84

806)

RADIAL



OTHERS



#### \* COMPUTERIZED RADIAL GRIDS

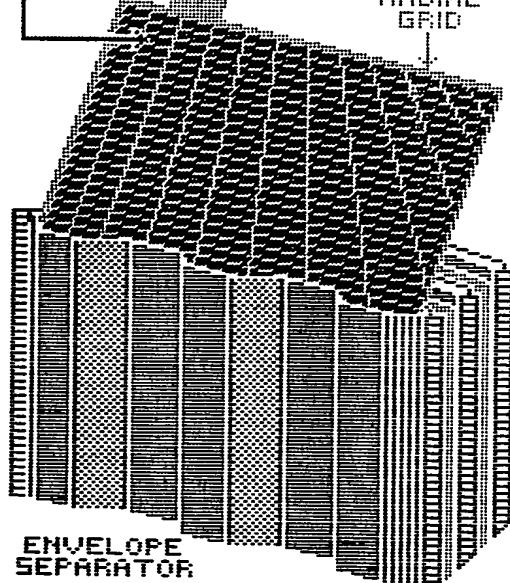
- + Allow the shortest, most direct electrical flow to the terminals for faster starts
- + Developed by computer to guarantee the most efficient design possible

FIG. 85

804)

ACTIVE MATERIAL

RADIAL GRID



#### ENVELOPE SEPARATORS

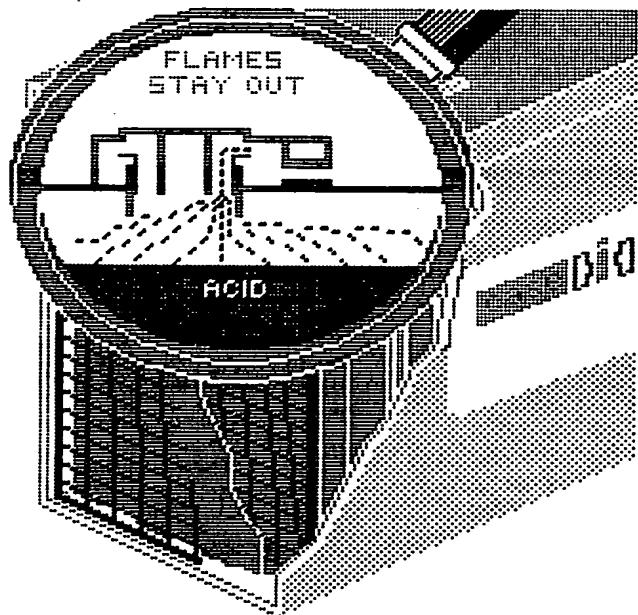
- + Fully enclose grid plates to prevent direct grid-to-grid contact which results in a short circuit
- + Contain the shedding of active material from the grids due to vibration by keeping shed material in contact with grid

**FIG. 90**

826

**"FLAME ARRESTOR"  
VENT PLUG**

Allows gas to escape but prevents external flames or sparks from entering the battery

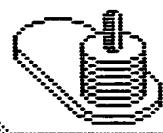


**FIG. 91**

828



**STANDARD**



**STUD TYPE**



**COMBINATION POST**



**TAPERED**



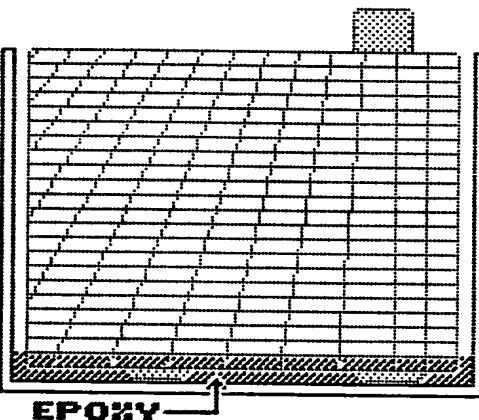
**SIDE TERMINAL**



**L-TYPE**

**\* TERMINAL DESIGNS**

- + CASEIH batteries offer a wide variety of terminal designs to meet your every need



### **SUPERIOR ANCHORING**

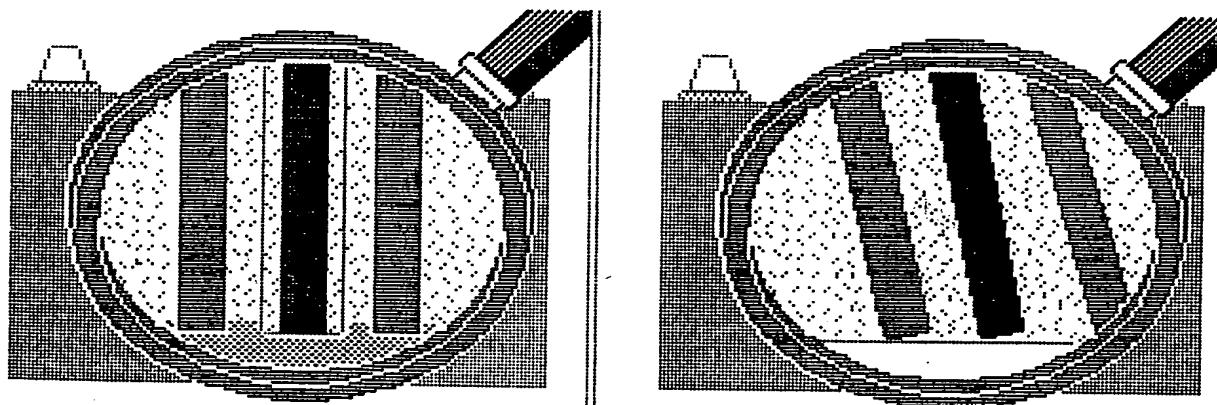
- + CASEIH only uses epoxy in the manufacturing process of its batteries
- + Epoxy is vastly superior to hot melt glue in its adhesion to dirty surfaces
- + Reduces grid plate vibration which is the major failure problem of heavy duty batteries

**FIG. 86**

818

**FIG. 87**

820



◆ EPOXY BASE ■ POSITIVE ELECTROLYTE (ACID) ■ NEGATIVE

#### **\* GRID VIBRATION**

- + Epoxy anchoring of grids helps to eliminate vibration damage by securely holding grids in place
- + Helps prevent shedding of active material and lengthens battery life

FIG. 88

822

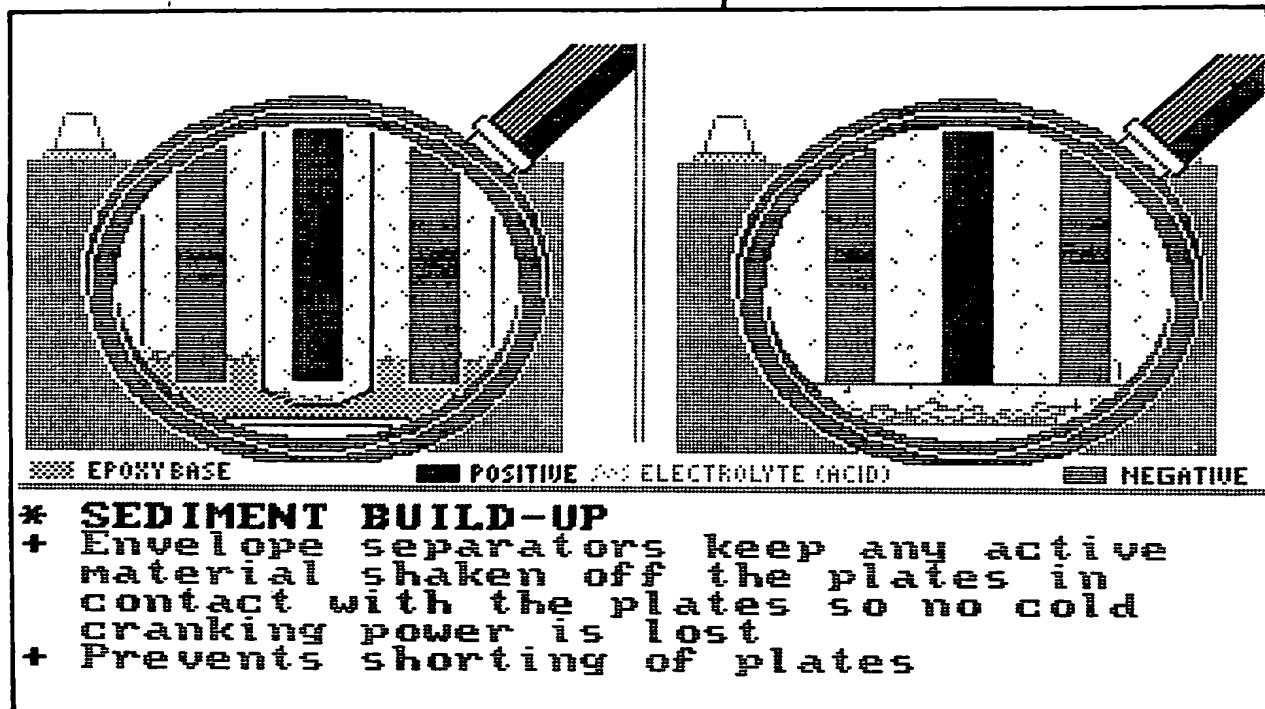


FIG. 89

824

